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SELECTED PAPERS.

On Rheumic Acid. By JOHN HENDERSON, Esq. *Surgeon.*

[From the Annals of Philosophy, for October, 1816.]

To Dr. Thomson.

Lawton, Dec. 1, 1815.

SIR,

I MUST beg to be allowed a corner of your Journal for the insertion of a paper, the subject of which will, I trust, be interesting to some of your readers, when it is found to contain the history of a substance hitherto unknown in the chemical world; and though I am well aware that it may contain some inaccuracies, I am certain of its meeting with every necessary indulgence from those who are able to appreciate the difficulty of such an investigation.

Having for a long time remarked that, amongst the immense variety of vegetable productions, but a very few salts were peculiar to them, and being anxious to prove for myself that no others existed, I entered on the analysis of some of them, with as much care as circumstances would allow; and amongst other plants, I subjected to experiment that commonly called rhubarb, class *enneandria*, genus *monogynia*. I had two reasons for choosing this plant; the first was, that I conceived it

might contain a very considerable portion of the citric acid, and that this article might be more advantageously manufactured from it; and, secondly, that it might contain an acid peculiar to itself: and this idea, I was happy to find, was not altogether groundless.

Exper. 1.—Having expressed the juice of the stems of the rhubarb, first by beating them in a mortar, and afterwards passing the whole through a cloth, I put in gradually a quantity of powdered chalk, tasting the liquid now and then, till I found that the juice had lost every trace of acidity, and the liquor, from being clear and colourless, became cloudy. It was then allowed to settle for some time, when the supernatant liquor was carefully poured off, and pure water put in its place. The whole was then perpetually stirred, that the powder at the bottom might be completely washed. Again the water was cloudy; and the same was repeated till it was nearly pure. This, last of all, was drained off also; and in its place a quantity of sulphuric acid was added, diluted with twice or thrice its bulk of water.

A very strong effervescence, as may be supposed, took place, while the whole swelled to three times its former bulk, and at the same time a vapour issued, giving a sensation of smell like the concentrated juice of rhubarb, evidently showing that a part of the pure acid of the rhubarb was then in a state of vapour. When the acid was poured in a stream upon any part of the powder, it assumed a purple or black colour, as is the case in pouring sulphuric acid on phosphate of lime. While the effervescence continued, the mixture was frequently stirred, and afterwards was allowed to stand for twelve hours. The liquid part was then drawn off into a Florence flask, where it was evaporated to one-fourth, and set to crystallize. The first crystals formed were the most beautiful I ever saw; they were as white as snow, and shining like the crystals of benzoic acid. I had, however, to resort to a more accurate experiment to ascertain their form and properties.

Exper. 2.—8 lbs. of the stalks of the rhubarb were taken, deprived of their leaves, from which was obtained about a pint and a half of juice.

	lb.	oz.
The pint weighed	4	$4\frac{1}{2}$
Remaining juice	2	1
	6	$5\frac{1}{2}$
Ligneous remainder	1	7
	7	$12\frac{1}{2}$

$3\frac{1}{2}$ oz., therefore, were lost during the operation.

To this liquor $13\frac{1}{2}$ oz. of powdered chalk were added, until no taste of acidity could be perceived. Still, however, on the liquor being put to the test of tincture of litmus, the colour was instantly changed to red. Having found this for a considerable time after no acid taste could be perceived, I began to suspect that this test might be a fallacious one, on account of the water being by this time saturated with carbonic acid gas, which, I need not say, issued in bubbles from the chalk. I then ceased to put in more chalk, but after stirring it well, set it by to settle, and allowed it to stand 12 hours, when the liquor was drawn off, and a gray powder remained at the bottom, which was the rheumate of lime.

This powder was washed, as formerly, five or six times. Next day, on examining the fluid first drawn off, I was, I confess, a good deal surprised to find that it had assumed a blackish purple colour; and, what is singular, the same took place in every other experiment; therefore this was a liquid which possessed little or no colouring matter whilst its acid existed, whose colouring matter became evident on that being removed. This appearance, also, it must be mentioned, could not be owing to iron, for the liquid was contained in an earthenware vessel.

I was now very much puzzled regarding the exact quantity of sulphuric acid necessary to form a neutral sulphate of lime.

By analysis, sulphate of lime is composed of 32 chalk and 46 acid. But the specific gravity of chalk and acid are as 11 chalk : 7.5 acid, as 13.8. Chalk is to a fourth proportional 11: 7.5 :: 13.8 : 9.3; and by multiplying the third by 32, and

fourth by 46, the proportion is 427 : 415.14, or in nearly equal proportions. However, I found that a greater proportion of rheumate of lime was necessary to saturate the sulphuric acid; for 8 oz. saturated the whole 13½ oz. I must here remark, that when the acid is poured on the chalk in a concentrated state, the gray powder is apt to get into lumps, and always turns of a blackish purple. Water was then added to the mass; and when the effervescence began, the smell of the rheumic acid was very agreeable, though too strong to be borne for any length of time. The liquor, after having stood for 24 hours, during which time it was repeatedly stirred, was drawn off, and put into shallow plates by the side of a regularly heated stove. I afterwards, however, found it convenient to make use of a hot-house; and after being evaporated to about ¼, they were set aside to crystallize, the liquor assuming a slightly red colour during evaporation. The crystals, as soon as formed, were taken out of the liquid, and dried in paper. The first formed were the whitest, and those constituted what chemists denominate *needle-formed* crystals, resembling nearest of any the crystals of benzoic acid.

The method I have chosen to prepare this acid, I am sensible, is on many accounts a difficult and laborious process; at the same time there is a very considerable quantity lost during the operation. It also contains a quantity of selenite; so that it is always necessary, in order to obtain it pure, to crystallize it a second time: but although it contains that foreign salt, when it is crystallized a second time, the form of its crystals are still the same. As I mentioned before, there is a considerable loss during the operation, which is owing to a property it has in common with the citric acid of being acted upon by sulphuric acid; and, therefore, when the evaporation has gone a certain length, the sulphuric acid becomes concentrated, and reduces the other acid to carbon, which is one of its ingredients; and I therefore allow that an easy method of preparing it remains yet to be discovered.

I once tried another method of preparing it, which, though it was not more successful, led me, however, to a conclusion which I conceive of no small importance. Instead of using

chalk in preparing the acid, I tried the effect of quick lime; when, in place of carbonic acid gas being given out, as formerly, *ammoniacal* vapours issued. This, as might be supposed, attracted my attention; but it was some time before I could acquire a satisfactory explanation of it. I at first thought that there might have remained a quantity of vegetable matter amongst the lime, and that, during the process of shaking, a part of the water was decomposed, while the vegetable matter, from the heat, gave out *nitrogen*, which attached itself to an atom of *hydrogen*. This was, however, a very doubtful explanation; and I afterwards altered my opinion, from some other circumstances; and I am now convinced that the rheumic acid exists in the plant under the form of *rheumate of ammonia*.

In an experiment I made some time afterwards, in order to prove whether any connexion existed between *this* acid and the *citric*, I added a quantity of mercury in its metallic state to a solution of rheumic acid, which was immediately acted on. I then tried whether the juice would act on mercury when assisted by heat; and I was happy to find this was the case. This induced me to try the same thing in other experiments; and at length I applied the juice in a concentrated state, which was done by evaporating it to dryness by the action of a slow fire. The mass thus formed was of a brown colour, with evident marks of crystallization. It was rather deliquescent than otherwise, and the taste was that of acid and salt, rather inclining more to salt. To this I added a small quantity of alcohol; and having mixed the whole together, the albumen was dissolved, and small crystals were deposited in the bottom of the vessel. These were taken and dried. They were found to resemble the salt commonly known by the name of *salt of lemons*. On being placed on a red-hot iron, they first swelled in the form of a pyramid, giving out at the same time certain *gases*, and afterwards there remained only a black coal. The same thing happens when pure acid is put upon a red-hot iron.

From certain experiments I made on the pure acid, I conceive it to be composed of 31 oxygen and 69 carbon. In this, however, I may be mistaken; for, from the apparatus I pos-

sessed, I could not perform any very delicate experiment. The last time I prepared any of the acid, instead of putting the chalk in the vessel containing the juice, I divided it into five equal portions, each of which was put into a separate vessel,

A part of the juice was then poured on No. 1; and, after standing some time, was drawn off into the one marked No. 2; and this was drawn off in the same way, first into No. 3, then into Nos. 4 and 5. When it came to the last, not the slightest mark of acidity could be perceived by the most delicate test. Another quantity of juice was then applied in the same way, till the whole was saturated. This plan I conceive to be far better than the first way of doing it; and I may at the same time also mention, that I at length extracted the juice, not only from the stems, but also from the leaves, by boiling them to a syrup.

I conceive there might still be another way of preparing this acid; which is, after dissolving a quantity of acetate of lead in water, to add a quantity of the juice of the rhubarb.

A white precipitate will then fall to the bottom, which must be allowed to settle, and the supernatant liquor be poured off. Then to this is added a quantity of *nitric* or *nitrous* acids; and when it has been allowed to stand some time, it is drawn off and evaporated, as in the foregoing experiments.

Dissolve the crystals, and then evaporate it a second time. The acid, when obtained pure, is soluble in about two parts of water, and is slightly deliquescent. It differs materially in its crystals from all the acids yet known, coming nearest to the *benzoic*; it is not, however, so flocculent, has not the aromatic smell, is more soluble, and of greater specific gravity.

There are four acids which it resembles in a few of its effects; it will, therefore, be necessary, before going further, to enumerate those properties which discriminate them from the acid now under our consideration.

These are the citric, oxalic, tartaric, and benzoic acids.

Citric Acid.

This acid forms beautiful rhomboidal crystals. Citrate of potash is very soluble, crystallizing with difficulty, and very

deliquescent. Citrate of soda has a saline taste; its crystals are that of a six-sided pyramid. The supercitrate of lime is a crystallizable salt, and is soluble in water.

Quicksilver is not acted on in its metallic state, but is readily acted on when in the state of an oxide. It forms small crystals, scarcely soluble.

Zinc is dissolved by it, and forms small brilliant crystals, nearly insoluble.

Oxalic Acid.

This acid is obtained in slender four-sided rhomboidal prisms.—The salts of the oxalic acid are scarcely soluble, such as oxalate of soda, which can scarcely be obtained in regular crystals. The oxide of mercury is dissolved, which forms a white powder that blackens on exposure to the sun.

Copper is dissolved by it, and a powder is obtained from their union of a pale blue colour, and scarcely soluble.

Lead, when digested with it, forms crystallized grains that are scarcely soluble, except when an excess of acid is used. With tin it forms prismatic crystals. Zinc is converted by it into an insoluble powder, which, however, becomes soluble on an excess of acid being employed. With the white oxide of arsenic, it forms prismatic crystals.

Tartaric Acid.

This acid crystallizes in prisms and pyramids. Tartrate of soda crystallizes in fine needles.

It combines with the oxide of mercury, and forms an insoluble compound. With tin it forms a white powder, and precipitates a solution of bismuth white.

It dissolves the oxide of antimony.

Benzoic Acid.

This crystallizes in soft flocculent crystals, which possess an aromatic smell, that is increased by heat. It is scarcely soluble in cold water. Benzoate of lime is soluble. Oxide of tin is not dissolved by it; but antimony is.

It would be needless to detail the differences between the rheumic acid and the other vegetable acids, as there does not exist the slightest resemblance between any of them.

Rheumate of Potash.

To a solution of the acid was added a small quantity of pure potash; and after the effervescence had ceased, I set it by to crystallize.

Small crystals were formed, but I did not ascertain their form. They had rather an acrid taste, and tinged bismuth green.

I confess I was considerably surprised, on adding the caustic alkali to the pure juice, to observe that, when it came to the point of saturation, the whole assumed a deep red or purple colour, at the same time that the albumen was precipitated of the same colour. After filtering the solution, I set it to crystallize. The crystals formed were red, but by washing they became transparent.

This salt is not deliquescent: it may, therefore, be distinguished from the tartrate, citrate, oxalate, and benzoate of potash.

Rheumate of Soda.

This salt I have formed, either by adding carbonate of soda to the pure acid, or in an impure way by adding it simply to the juice. In the latter way it has the same effect upon it as the pure potash has with regard to changing its colour, and precipitating a part of the albumen. When evaporated, it is obtained in the form of a four-sided prism. Of this, however, I was not quite certain, as those I chose for my examination were very irregularly formed. This salt is not deliquescent, and possesses alkaline qualities. It may, therefore, be distinguished from the citrate, oxalate, and tartrate of soda.

Rheumate of Ammonia.

This salt I have not yet examined.

Rheumate of Iron.

The concentrated or simple juice acts very readily on iron in its metallic state, especially if assisted by heat. It also acts on the carbonate and oxide of iron. The crystals thus formed are small, but I am not certain as to their exact form.

The carbonate of soda precipitates it of a gray colour; and, on the other hand, the rheumate of iron precipitates the acetate of lead. With the prussiate of potash a blue precipitate falls to the bottom; and with tannin it forms a blackish precipitate. When the acid is made to act on iron, it first converts it to a black oxide, and then dissolves it. It possesses rather a caustic taste.

Rheumate of Zinc.

The rheumic acid seems to have a great affinity for zinc. It acts very violently on it when in the state of the white oxide. The solution is of a straw colour; and when the carbonate of soda is added, it is precipitated of an orange colour. This salt does not crystallize. It possesses a very caustic taste; and, when added to the acetate of lead, a precipitation takes place. This, I suspect, is owing to a superabundance of the rheumic acid. It may be distinguished from citrate and benzoate of zinc.

Rheumate of Tin.

When the plain or concreted juice is boiled on tin foil, it forms first a darkish coloured oxide, and then dissolves it. When the juice is used for this experiment it turns of a blackish purple colour. If the pure acid is used, care must be taken that it contains no sulphuric acid.

When crystallized, it forms five-sided obtruncated pyramids. It may, therefore, be distinguished from the tartrate and benzoate of tin.

Rheumate of Antimony.

The rheumic acid has very little action on the oxide of this metal. However, it dissolves it in a slight degree, which may

be shown by chemical tests. Its crystals have not been examined.

Rheumate of Mercury.

This acid has a very considerable affinity for mercury, and acts upon it in its metallic state; even in the diluted way, it exists in juice. This was the first test that assured me it was different from the citric acid. On all its oxides it has similar effects, changing their colour before dissolving them.

The oxide of mercury may be again precipitated in the form of a yellow powder. In its crystals it exactly resembles those of water, shooting out in a most beautiful manner. They possess a shining appearance, and resemble in some measure the crystals of oxalic acid.

When exposed to the sun, they do not change colour. They may, therefore, be distinguished from oxalate of mercury, tartrate of mercury, and citrate of mercury.

Rheumate of Copper.

The rheumic acid dissolves the oxide of copper; and, when evaporated, it forms a powder of a dark green colour, which takes a considerable quantity of water to dissolve it. It may, therefore, be distinguished from oxalate and benzoate of copper.

Rheumate of Bismuth.

The rheumic acid dissolves the white oxide of bismuth very readily, and forms with it small crystals. It may, therefore, be known from tartrate of bismuth.

Rheumate of Arsenic.

This acid dissolves the white oxide of arsenic, and forms crystals of a pretty large size. They seem to be irregular cubes; and, therefore, can be distinguished from benzoate of arsenic and oxalate of arsenic.

Rheumate of Lead.

With this metal it forms an insoluble compound; and from

my observations I should conceive this to be one of the best tests of lead existing in any fluid.

I have not yet fully investigated the action of this acid upon the various earths. With lime, however, it forms an insoluble compound; nor does it become soluble when an excess of acid is added, as the supercitrate of lime does. It also dissolves magnesia and argile; but the crystals formed by these I have not yet examined.

The stronger acids, when distilled with it, have the effect of charring it.

I have now brought this paper to a conclusion; and though the investigation is still in its infancy, it may perhaps have the good effect of stimulating some one to prosecute this very curious, and, I may add, very useful subject.

J. Henderson.

History of a very fatal Affection of the Pudendum of Female Children. By Kinder Wood, Esq. Member of the Royal College of Surgeons, and Surgeon in Oldham. Communicated by Mr. Abernethy.

[From the Medico-Chirurgical Transactions, Vol. VII.]

The disease, to which I wish to call the attention of the Society, has attracted so little the notice of medical authors, and is so extremely fatal, that I trust no apology is necessary for throwing together such remarks upon it, as have occurred from time to time in the course of my practice.

Of this affection I have seen twelve cases, all occurring in patients between one and six years of age: of these only two recovered, and they were the only cases in which my attendance was required early in the disease. My notes of these two cases have enabled me to describe the earlier appearances of the disease. The great rapidity with which it proceeds to an extent, which the tender constitutions of infants and chil-

dren are unable to support; the insidious manner of its first appearance; the similarity in its commencement to some ordinary affections of the parts; its novelty, for I have always seen parents more surprised than alarmed; all these circumstances contribute to that period being passed over, when alone medical means can be serviceable.

The commencement of this affection is attended with chilliness succeeded by heat; slight pain in the head, dulness, nausea, loss of appetite and thirst; the tongue has a clay-coloured deposit; the bowels are torpid, and the patient is languid, inert and listless. These symptoms precede the affection of the pudendum about three days. The patients first call the attention of parents more particularly to the seat of the disease by complaints of pain in voiding urine, or when too young this is observed by the cries and struggles of the child during the act of emptying the bladder. When the genital organs are examined, one or both labia are found inflamed and enlarged, the inflammation is of a dark tint, and soon extends internally over the clitoris, nymphæ and hymen; the pain in voiding the urine may induce a supposition that the inflammation extends into the urethra, and a thin secretion, which at this period may be observed coming from these parts, renders it not improbable that the lower part of the vagina may be affected.

From this period of the formation of the inflammation so rapid is the progress to ulceration, that scarcely twenty-four hours elapse before a number of small vesications forming within the labia, as well as externally, burst and form so many open surfaces which, quickly spreading into each other, form larger ulcers; this was the progress in one case, in the other the skin opened without any previous vesication. The thin discharge which the inner membrane secretes, is now mixed with the secretions from the ulcerations, and is dark coloured, peculiarly offensive, and copious, irritating the adjacent parts, and contributing to extend the disease along the perinæum to the anus, and to the inner part of the top of the thigh, contiguous to the labia. I have also seen the inflammation spread over the mons Veneris, and be succeeded by deep ulcerations progressively extending as long as life continued.

The pulse is quick and irritable after the inflammation commences, and, as the ulceration extends, the face becomes of a peculiar pallid hue, the skin having a very singular whiteness, which I have never seen absent after the ulcerations had formed. As the bowels are slow at this period, the opening remedies uniformly bring away dark, slimy and offensive stools; and in two or three cases I have seen aphthæ spread extensively around the anus, and over the perinæum, and most extensively in a case which I shall have occasion to detail.

The ulcerations in this affection are not of an equal depth, or appearance, but various in this respect, as well as in the state of the bottom, which in some places is foul as well as deep, in others superficial and sprinkled with small red granulations.

It may be easily conceived, that in such a state of the organs of generation, the pain upon moving the pelvis is excruciating; and hence the patients, when sufficiently old to consult their own ease, constantly lie upon the back with the knees bent and thrown open; this circumstance of pain being produced upon the least motion greatly aids the tendency to inaction in the bowels. There is a most important symptom arising from the extreme pain and tenderness of these organs, viz. a retention of urine, attended with its usual concomitants, tenderness and swelling of the abdomen; and this is so common as to require a vigilant attention, and a vigorous exertion of parental authority, to induce the patient to resort to a voluntary effort.

It has not appeared to me that this disease required any particular time to finish its course, this depending upon the vigour of the patient's constitution, and the original violence of the attack. From the time that the ulcerative action is completely established, the enlarged labia diminish, and the redness disappears, the ulcer successively extending over parts which had been inflamed. The character of the disease at this time is that of a deep, foul, and spreading ulcer, upon parts weakened by a peculiar inflammation, and a constitution injured and weakened by previous febrile symptoms. The external organs of generation are now progressively destroyed; the peculiar pallor of the countenance increases; the pulse be-

comes quick and weak; the appetite fails; the bowels become loose; the skin of the thighs hangs loose and flabby as in marasmus; the discharge from the parts increases and becomes more and more offensive, till the patient is worn out and expires.

But if this disease is early seen, and checked by the proper use of applications and remedies, the ulcerations clean and heal, but never without leaving the constitution debilitated and injured. After the sores are healed, there continues a copious yellow mucous discharge from the vagina and external organs, which hinders the patient from recovering strength, and keeps up a tendency to the recurrence of the disease, which I have twice seen, and which in one case proved fatal.

The duration of this affection is various: in one case the patient got better in twenty-three days, in a second she recovered in seventeen days; it is to be understood that we speak here of the original disease; the mucous discharge, unusual paleness, and general debility, continuing six or eight weeks; but these are only to be looked upon as the consequences of the original affection. It is not possible to say what may be the duration of a fatal disease, this depending on so many circumstances of violence, constitution, &c. which must necessarily influence the rapidity of the termination. Where the ulceration is deep and extensive I have never seen the patient recover. I have never seen the affection terminate in mortification but once; and in this case, which proved fatal, I was a spectator of the treatment, which consisted in the application of powerful stimulants to the parts affected. This treatment undoubtedly originated in an incorrect view of the disease, and under this plan the external organs tumefied largely, and the supervention of mortification soon completed its course.

The similarity of this affection to some of the more violent cases of intertrigo, or galling, is very evident in its commencement; but the intertrigo, when found near the organs of generation, commences in the deep space betwixt the labia and the thigh: whereas the affection here spoken of, uniformly commences on the anterior part of the labia, and extends internay over the parts contained within the fissura magna; after the

secretion begins to be copious, the adjacent parts, to which the matter is applied, assume the same actions, as the perinæum, anus, and top of the thigh. It is probable that Armstrong had seen some cases similar to the subjects of this paper, as may be gathered from his Essay on the Diseases of Children.

If any similarity can be traced betwixt the subject of this paper and any other described disease, I presume it is the erysipelas infantilis; but even here there are so many points of difference, that the identity of the two diseases can by no means be allowed. Dr. Underwood, whom I shall here quote, states that the erysipelas infantilis ordinarily attacks within "a few days after birth: it was remarked (says he) in the former edition, that it was thought never to appear later than the month; but I have since seen it in a child of two months old." The affection which is my present subject, I have never seen under one year old, but frequently from one year up to six years of age; the patients who recovered were five years and a half, and six years of age, and I shall presently quote another four years old. Dr. Underwood states that the milder species forms matter in a very short time. The formation of matter never takes place in the disease I describe, the inflammation runs early into ulceration, but never suppurates, matter only appears as the secretion from the ulcerated surface. Again, Dr. Underwood states that the more violent kind very often mortifies, whereas the disease I speak of rarely runs into mortification unless improperly treated, as in the case before attended to; and it may be well here to observe, that the chief stimulant used in the case as an application, was the ol. camphoræ, which increased all the symptoms; whereas Dr. Garthshore found "linen compresses wrung out of camphorated spirit, successful in checking the inflammation" in the erysipelas infantilis.

These may be thought sufficient points of distinction, but more will be found if we refer to the dissections of the two diseases. In the erysipelas infantilis "upon examining several bodies, after death, the contents of the belly have been frequently found glued together, and their surfaces covered with inflammatory exudation;" "in males the tunicæ vaginales have been sometimes found filled with matter, which has evidently

made its way from the cavity of the abdomen;" " in females the labia pudendi are affected in like manner, the pus having forced a passage through the abdominal rings." Now, in a case which I shall hereafter quote, the body having been inspected, " the abdominal and thoracic viscera were found to have been free from disease." The erysipelas infantilis attacks equally male and female infants, whereas the disease here spoken of attacks female children alone. I presume that the circumstances above stated will be sufficient to show that these diseases are distinct from each other; indeed, so far is any inflammatory affection of the contents of the abdomen from accompanying this disease, that the patient evidently sinks under the debilitating influence of a deep and spreading ulceration; and the organs of generation never exhibit any collection of matter, either as originally formed in their substance, or as the consequence of suppuration in the cavity of the belly. From all these considerations, it is not unreasonable to conclude the disease to be of a distinct and specific nature; its progress, its early termination in such deep and extensive ulcerations, the peculiar whiteness of the face which I have never seen absent, its being confined in its commencement to the organs of generation, and being preceded by its specific fever, all tend to confirm the opinion. Like to all other inflammations, which end in the early destruction of parts, this is attended with fever of a low kind; the pulse, which early in the disease is frequent and weak; the clay-coloured tongue, torpid bowel, and vitiated biliary secretions; the dull headache, langour and lassitude show this; the purple hue of the inflamed parts, and their early ulceration, with an aggravation of the symptoms, compel us to consider it as a disease of debility, and necessarily lead to the plan of cure.

In this disease, the first part of the treatment is to move the sluggish bowels; for which purpose a sufficient dose of the submurias hydrarg. with pulv. rhei, will answer best, and uniformly bring away dark-coloured and offensive stools. The affected parts should be frequently washed with the liquor plumbi acetatis dilutus, slightly aired, and poultices made with the same liquor, and soft bread, applied warm immediately

after the parts have been washed. The intention of these means is to sooth and diminish the inflammation, and they should be persisted in during the inflammatory action, and till the progress of the ulceration is checked, and even longer if tenderness, excoriations, or aphthæ, should affect the perinæum, or anus.

It will be necessary to commence the use of bark in decoction, as soon as the ulcerative action is commenced; I have commonly added the confectio aromatica with tinct. columbæ, and small doses of tinct. opii: during the use of these means, the bowels should be opened every second or third day; and a moderate use of red wine may be allowed.

In the latter part of the disease, when the tumefaction and redness are diminished, and the ulcerations stationary, I have found the ung. oxidi plumbi albi very useful.

When the bowels become loose, which they do in the latter stages, the elect. mimosæ catechu is of excellent service, as a warm and powerful astringent, increasing at the same time the dose of tinct. opii. When the bowels would bear the use of the bark in substance, I have often given it, and have often seen the plan render a spreading ulcer stationary, and protract the fatal termination, where the constitution had received an injury it was unable to repair.

There is one point of view in which a consideration of this disease is highly important. The instances in which parents, on behalf of children, bring forward individuals upon the charge of rape, are disgustingly frequent; and it can scarcely be doubted, that this disease has been frequently considered in court as evidence of violence and venereal infection; inflammation, ulceration and discharge having always had particular attention in a consideration of the evidence. That very erroneous conclusions may be drawn from a superficial inquiry into these symptoms, will be evident from the preceding observations. I subjoin the following case, which has not hitherto attracted sufficient attention, both as an illustration of this point, and an additional evidence of the existence of this singular affection.

"Jane Hampson,* aged four, was admitted an out-patient of the (Manchester) Infirmary, February 11, 1791. The female organs were highly inflamed, sore and painful; and it was stated by the mother, that the child was as well as usual till the preceding day, when she complained of pain in making water. This induced the mother to examine the parts affected, when she was surprised to find the appearances above described. The child had slept two or three nights in the same bed with a boy fourteen years old; and had complained that morning of having been hurt by him in the night.

"Leeches, and other external applications, together with appropriate internal remedies, were prescribed; but the debility increased, and on the 20th of February the child died. The coroner's inquest was taken, previously to which the body was inspected, and the abdominal and thoracic viscera were found to have been free from disease. The circumstances above related having been proved to the satisfaction of the jury, and being corroborated by the opinion I gave, that the child's death was occasioned by external violence, a verdict of murder was returned against the boy with whom she had slept. A warrant was therefore issued against the boy, but he had absconded, a circumstance which was considered as a confirmation of his guilt, when added to the circumstantial evidence alleged against him.

"Not many weeks however had elapsed, before similar cases occurred, in which there was no reason to suspect that external violence had been offered; and some in which it was absolutely certain, that no such injury could have taken place. A few of the patients died, though from the novelty and fatal tendency of the disease, more than common attention was paid to them. I was then convinced I had been mistaken in attributing Jane Hampson's death to external violence; and I informed the coroner of the reasons which produced this change of opinion. The testimony I gave was designedly made public, and the friends of the boy hearing of it, prevailed upon him to surrender himself.

* See Medical Ethics, by Dr. Percival. Note by Mr. Ward, of Manchester, page 231.

"When he was called to the bar at Lancaster, the judge informed the jury that the evidence adduced was not sufficient to convict him; that it would give rise to much indelicate discussion, if they proceeded on the trial; and that he hoped, therefore, they would acquit him without calling any witnesses. With this request the jury immediately complied."

CASE I.

On January 22d, 1815, I was desired to see Miss R. aged six years: she had complained three or four days of headache; had been chilly, and occasionally hot; she had been sickly, and taken little food; was dull, heavy, and languid. This morning she had complained of pain in making water: upon examination the pudendum was found inflamed; upon which I was called in.

The inner surface of the left labium was ulcerated, as well as the clitoris; the right labium was inflamed, and the whole parts tumefied, of a dark purple hue, not unlike some kinds of erysipelas; the mons Veneris was enlarged and enflamed; the perinæum was enflamed and covered with aphthæ, which also encircled the anus; the discharge was thin, copious, and offensive, and had inflamed the top of the thigh, where it had been suffered to remain. The face had a peculiar paleness; the bowels were slow; the pulse quick and weak; the appetite diminished; the tongue of a dull clay colour. She was thirsty, complained of chilliness, and was indisposed for motion. The liquor plumbi acetatis dilutus was ordered as a lotion, to be applied lukewarm; and poultices made up with the same fluid were directed. A decoction of bark was also given with confectio cardiaca.

By the use of these means, the enlargement of the parts gradually subsided, the foul bottom of the sores became red, after which the ointment of white lead was used, and the parts healed by the 14th of February, a space of seventeen days from the first attendance.

In this case the affection again returned, but was early cured by resorting to the same remedies. The patient frequently retained the urine twenty-four hours, the pain was so violent, and obstinately resisted every inclination to empty the bowels,

so that the opening remedies were obliged to be exhibited with a regular attention.

CASE II.

On the 25th of April, 1815, I saw Miss S. aged five years and a half. She had been unwell a few days previous to the 21st, when, complaining of pain in voiding the urine, the parts were examined and found slightly red; they were washed with milk and water, and dusted with the lapis calaminaris. On the 22d the inflammation had increased, and the parts were slightly excoriated. On the 23d a thick yellow discharge was observed, the patient was getting more unwell, the bowels were slow. On the 24th the open surfaces were enlarging, and small watery vesicles appeared upon the labia and perinæum; upon the left thigh also was a large cluster; the bowels were twice opened this day by some family purgative.

On the 25th I saw the patient, and found both labia enlarged, and of a purple redness, with numerous small watery vesicles, upon the external surface, and also within the fissura magna. They were similar to cowpock vesicles of the third and fourth day; were found also upon the perinæum, and the top of the left thigh. In some places the tops of the vesications were loosened, and showed beneath a deep foul ulcer, particularly in the cluster upon the thigh, and on the anterior part of the labia. The parts within the fissura magna were every where red and inflamed, and several small ulcers were found. The skin around the anus was painful and red; and the secretion was then copious and offensive. There was a dull headache, a quick and irritable pulse, a moist tongue, but bearing a clay-coloured deposit; the motions on the 24th were dark-coloured and offensive; the patient was considerably weakened, and the face of a peculiar paleness. I advised saturnine lotions slightly warmed, and saturnine poultices without oil, to the parts, and gave small doses of pulv. rhei in a saline mixture every three hours.

April 26. Fresh vesications still appearing; and when the tops of the earlier vesicles had come away, the parts beneath were deeply ulcerated. Several aphthæ were observed within the labia, upon the perinæum, and around the anus. The skin

was hot and dry; the bowels open, and motions dark and offensive; with excessive pain upon voiding the urine.

27th. The top is thrown off from the cluster of vesicles upon the thigh, as well as from the vesications upon the pudendum and perinæum; the open surfaces are deep and foul, secreting largely a thin and offensive matter; the anus surrounded with aphthæ; the pulse 120; skin hot and dry; bowels open, and urine excessively hot and painful. Ordered a decoction of bark, with the conf. cardiaca; recommended a little red wine to the patient, and to continue the applications to the parts.

28th. The bowels slow; the urine has been retained thirty hours; the abdomen tender and hard; with much difficulty she was prevailed upon to void the urine, which was copious, high coloured, and of a strong smell: the aphthæ had almost disappeared, and the diseased parts showed a large ulcer of various depths, extending over the pudendum and perinæum, down to the anus; the parts within the labia were in the same state, and a deep ulcer, but not extensive, lay upon the left thigh, on its upper and inner part; the secretion is thin, copious, and offensive. The sores were ordered to be washed with the lotion as usual, and dressed with the white lead ointment. Continue the bark mixture, and increase the wine.

29th and 30th. The ulcerations were stationary; the same means were continued; but as the bowels were slow, they were moved with an infusion of senna.

May 1. Sores improving; the bottom becoming less foul, and discharge less offensive; pulse 90 and weak; appetite poor; sits up a little; great inclination to retain the urine; bowels open. Continue the applications and remedies.

2d. The sores improving, as well as the strength. This state of improvement continued regularly, till the sores were healed on the 14th. After the healing, the pudendum continued discolored and tender, and a considerable mucous discharge continued with varying quantity for the space of six or eight weeks; this was relieved by a continued use of the tinct. lyttæ, bathing the parts frequently in the day with a solution of the sulphas zinci; the shower-bath was also used with the intention of checking the secretion, as well as getting up the strength.

I saw this patient on the 27th of June, when the discharge had ceased.

Upon looking over my notes, I find that, in nine years, I have seen twelve cases; of these, I have only seen the two above related so early as to be materially serviceable; the others being among the children of labourers, had little chance, either from the attention or punctuality of the parents, of getting over so very formidable a disease. One, a little girl of two years old, recovered, and was attacked again in the course of a fortnight, which second attack proved fatal. In a girl, five years of age, where the earlier appearances of the disease had been entirely overlooked, the mother upon finding an extensive ulcer, brought the child to me, under the idea of its having received injury from fire, which had escaped attention. The case proved fatal.

Observations on the Treatment of Varicose Veins of the Legs.

By B. C. Brodie, Esq. F.R.S. Assistant Surgeon to St. George's Hospital, and Lecturer on Surgery.

[From the Medico-Chirurgical Transactions, Vol. VII.]

It seems to be established by the experience of modern surgery, that a mechanical injury inflicted on the trunk of one of the larger veins, is liable to be followed by inflammation of its internal membrane, and a fever of a very serious nature; and the occasional occurrence of these symptoms after the ligature, or even the simple division of the vena saphæna, has occasioned surgeons to be cautious in performing these operations for the relief of a varicose state of its branches in the leg.

But are the same ill effects likely to take place if a similar operation be performed on the branches themselves? Reflecting on the following circumstances, I was induced to answer this question in the negative. Varicose veins of the legs are so frequent in persons of the inferior order, (at least in the metropolis) that it cannot be otherwise, than that a considerable pro-

portion of those who apply at the hospitals on account of wounds of the legs, must labour under this disease; yet I do not recollect an instance of venous inflammation following such an accident; neither has such an instance occurred among a great number of cases which have come under my observation, in which the varicose veins of the rectum forming piles, have been removed by excision or by ligature.

It was recommended by Celsus to destroy varices of the leg, by the cautery, or by extirpating them with the knife; and the same operations have been performed (though but seldom) by some more modern surgeons. The consideration of the circumstances, which have been just stated, led me to venture on the adoption of a practice somewhat corresponding (though not exactly similar) to that of Celsus. Finding that it was attended with benefit to my patients, and that no ill consequences ensued, I did not hesitate to repeat the experiment in a considerable number of cases. It is the result of my observations on this subject, which I have now the honour of laying before the society; not in the belief that I am communicating surgical facts of the first importance, but hoping, nevertheless, that what I have to mention, will be found not altogether undeserving the notice of the profession.

Where the whole of the veins of the leg are in a state of morbid dilatation, and the distress produced by the disease is not referred to any particular part; there seem to be no reasonable expectations of benefit, except from the uniform pressure of a well applied bandage. But, not unfrequently, we find an ulcer which is irritable and difficult to heal on account of its connexion with some varicose vessels; or, without being accompanied by an ulcer, there is a varix in one part of the leg, painful, and perhaps liable to bleed, while the veins in other parts are nearly in a natural state, or, at any rate, are not the source of particular uneasiness. In some of these cases I formerly applied the caustic potash, so as to make a slough of the skin and veins beneath it; but I found the relief which the patient experienced from the cure of the varix to afford but an inadequate compensation for the pain, to which he was subjected by the use of the caustic, and the inconvenience arising

from the tedious healing of the ulcer, which remained after the separation of the slough.

In other cases, I made an incision with a scalpel, through the varix and skin over it. This destroyed the varix as completely as it was destroyed by the caustic, and I found it to be preferable to the use of the caustic, as the operation occasioned less pain, and as (in consequence of there being no loss of substance) the wound was cicatrized in a much shorter space of time. I employed the operation, such as I have described it, with advantage in several instances; but some months ago I made an improvement in the method of performing it, by which it is much simplified; rendered less formidable, not only in appearance, but also in reality; and followed by an equally certain, but more speedy cure.

It is evident, that the extensive division of the skin over a varix can be attended with no advantage. On the contrary, there must be a disadvantage in it, as a certain time will necessarily be required for the cicatrization of the external wound. The improvement, to which I allude, consists in this: that the varicose vessels are completely divided, while the skin over them is preserved entire, with the exception of a moderate puncture, which is necessary for the introduction of the instrument with which the incision of the veins is effected. Thus the wound of the internal parts is placed under the most favourable circumstances for being healed, and the patient avoids the more tedious process, which is necessary for the cicatrization of a wound in the skin above.

For this operation I have generally employed a narrow, sharp-pointed bistoury, slightly curved, with its cutting edge on the convex side. Having ascertained the precise situation of the vein, or cluster of veins, from which the distress of the patient appears principally to arise, I introduce the point of the bistoury through the skin on one side of the varix, and pass it on between the skin and the vein, with one of the flat surfaces turned forwards, and the other backwards, until it reaches the opposite side. I then turn the cutting edge of the bistoury backwards, and in withdrawing the instrument the division of

the varix is effected. The patient experiences pain, which is occasionally severe, but subsides in the course of a short time. There is always hæmorrhage, which would be often profuse if neglected, but which is readily stopped by a moderate pressure made by means of a compress and bandage, carefully applied. The same pressure which is necessary for the suppression of the hæmorrhage, is useful, as it keeps the divided surfaces in contact, so that they may have the opportunity of uniting by the first intention. With a view to the more certain attainment of this last object, care should be taken not to divide very extensively the soft parts below the varicose vessels. If the edge of the bistoury be sufficiently sharp, a moderate pressure will answer the purpose required; and if the pressure be considerable, a wound much deeper than is necessary will be the consequence. With the same view, the patient should be kept for the first four or five days in bed, in a state of perfect quietude, and when the bandage which has been applied is removed, this should be done with the greatest caution, lest any union which may have taken place be destroyed, in consequence of the uniting substance not having as yet acquired the due firmness of texture. By attending to these circumstances, an immediate cure of the wound is generally effected: where it is otherwise, no very considerable time is necessary for it to become healed by the process of granulation.

In every case, in which this operation has been hitherto performed, I have found it to be followed by the obliteration of the varix, and, indeed, it is difficult to conceive how it should fail in producing this effect. Sometimes no vestige of the divided veins has been to be distinguished afterwards; at other times they have remained for a certain period full of solid coagulum, which has gradually been absorbed. This difference probably depends on the different degrees of pressure made by the compress and bandage, and on the circumstance of the pressure being confined to the line of the incision; or of its being extended over the whole cluster of dilated veins. If there have been veins in a varicose state below those, which have been divided, and communicating with them, these have become contracted in size, and usually have presented no

appearance of disease afterwards. The good effects of the operation have however been most apparent in cases of varicose ulcer. In most instances the pain in the ulcer has ceased immediately. When the ulcer has been of a moderate size, it has sometimes been found perfectly healed in a few days, on the first removal of the bandages;—when it has been of a large size, it has begun to heal rapidly, although it had made perhaps little or no progress towards amendment under the treatment which had been previously adopted. Where there has been a varix below the ulcer, the division of it has been attended with more relief than that of the varix above the ulcer in other cases.

Inflammation of the coats of the veins has not occurred in any of the cases, in which I have hitherto adopted this method of treatment. I have already observed that there are some reasons for believing that the venous branches are less liable to be inflamed, in consequence of mechanical injury, than the trunks, in which they terminate. But, perhaps, something is also to be attributed to the integuments over the wounded vein being left entire. It is not unreasonable to suppose that a vein under these circumstances is not equally disposed to take on the action of inflammation with one, which after its division is exposed to the contact of the air, or other extraneous substance. The difference of the injury corresponds to that which exists between a simple and compound fracture, and it seems probable that there should be, to a certain degree, a corresponding difference in the effects which are produced.

In two or three cases inflammation of the adipose and cellular membrane has taken place, producing pain and tenderness of the limb, and a slight degree of fever; but this has speedily subsided with only this ill consequence, that the wound has failed in becoming united by the first intention, and that the healing of it has been effected afterwards, by the more tedious process of suppuration and granulation. The treatment in these cases is very simple. Cold lotions may be applied in the first instance, for the purpose of moderating the inflammation. When the suppuration has begun, the parts may be fomented and poulticed, and the ultimate cure of the small

abscess which remains may be promoted by a moderate pressure made with strips of linen spread with soap cerate, applied circularly round the limb.

In two instances the operation has been followed by an attack of erysipelas; but this must be regarded as an accidental occurrence, there having been at the same time several other patients in the hospital, labouring under this disease.

Having made these general observations, I shall not intrude on the patience of the society, by giving a detailed account of the whole of the cases from which they are drawn. From those of which I have preserved notes, I have, however, selected the four following, the relation of which will be sufficient to illustrate the remarks which have been made, and to explain the circumstances connected with this subject, which principally demand the attention of the surgeon.

CASE I.

Mary Narraway, 45 years of age, was first admitted into St. George's Hospital, on the 12th of October, 1814; on account of pain, swelling, and ulcers of the legs, with many large clusters of varicose veins.

October 15. Two clusters of varicose veins, which were larger and occasioned more uneasiness than the rest, situated on the posterior part of the calf of the right leg, were divided with the skin over them, by two incisions. There was considerable hæmorrhage, which was stopped by the application of a bandage.

Some inflammation of the skin and cellular membrane took place after the operation, for which she was bled. The wounds made by the operation were not completely healed till after some weeks. She was then affected by an inflammation of the eyes, on account of which she remained in the hospital till the 17th of January. At this time there was no vestige of the clusters of veins which had been divided, and the veins of the right leg generally were much diminished in size.

She was re-admitted into the hospital on the 31st of January, 1816.

She said that her right leg had been completely relieved by

the operation, and that she had no uneasiness in it until three weeks ago; when a small ulcer took place on the inside, a little above the inner ankle.

At the time of her re-admission there was a very painful ulcer of the size of a six-pence, on the inside of the right leg, with some varicose veins above and below the ulcer. The whole of the posterior and outer part of the leg, from the cicatrix downwards, presented no appearance of varicose vessels, and was free from pain; but the pain in the ulcer on the inside was such that she could scarcely bear to stand in the upright position.

In the left leg there were the same clusters of varicose veins which had existed when she was in the hospital formerly, but somewhat increased in size, and a quantity of purple discoloured skin on the inside. She said that she had for a considerable time laboured under a painful varicose ulcer of this leg, which had at last healed under the use of the adhesive plaster.

February 10. The cluster of varicose veins above, as well as that below the ulcer of the right leg, were divided in the manner described in the former part of this communication; the skin over them being left entire. The division of the veins occasioned considerable pain, which subsided in about an hour and a half.

February 14. On removing the bandage the ulcer was found perfectly healed. She was free from pain. The wounds made by the operation had healed by the first intention.

March 4. There was still a slight tenderness in the situation of the wounds; otherwise she was free from all uneasiness. There were no remains of the varices, which had been divided.

CASE II.

Anne Sadler, 38 years of age, was admitted into St. George's Hospital on the 21st of August, 1815, on account of varicose veins of the left leg, with a varicose ulcer of the inner ankle. She complained of great pain on the inside of the leg, which tormented her day and night.

On the 17th of September two large varicose veins on the

inside of the leg were divided by means of the bistoury introduced obliquely under the skin. One of these veins was situated about an inch and a half above the inner ankle, and the other about four inches higher, on the inside of the leg.

The wounds made by the operation inflamed so as to suppurate, and afterwards healed by granulation.

In the beginning of October the wounds were completely cicatrized; the ulcer of the inner ankle was skinned over; no vestiges were perceptible of the veins which had been divided. She was free from all uneasiness, except a very slight degree of tenderness in the situation of the wounds made in the operation.

October 9. She was discharged from the hospital as cured.

CASE III.

William Haines, 52 years of age, was admitted into St. George's Hospital on the 6th of January, 1816.

He had two varicose ulcers on the inner ankle of the left leg, one of the size of a shilling, the other smaller. These ulcers had existed for two years, and were exceedingly painful. There was a considerable varicose vein below the ulcer, and another of a larger size above; extending upwards from the ulcers, to join the vena saphæna major. There were two clusters of varicose veins on the calf of the same leg, connected with both the saphæna major and saphæna minor; one of them of a very large size.

The veins of the other leg were varicose in many parts, but there were no ulcers.

January 13. The varicose vein below the ulcers of the left leg was divided in the manner already explained. The large varicose vein extending upwards from the ulcers was divided also, about three inches above the ankle.

The operation occasioned considerable pain, which lasted through the whole night.

January 14. He was more free from pain than he had been for a long time before.

January 18. The compresses and bandages applied at the time of the operation were removed. The ulcers were healed.

The wounds made by the bistoury had united by the first intention.

January 19. The larger of the two varicose clusters on the calf of the leg was divided.

January 24. The bandages were removed. The wound made by the last operation had also united by the first intention. The leg was bound up in strips of linen spread with soap plaster, and a bandage over them.

February 20. He left the hospital. At this time the veins of the right leg were in the same state as at the time of his admission. There were no remains of the veins which had been divided on the left leg: there was no vestige of the ulcers, and the discoloured skin round them had recovered its natural appearance. He was desired to continue the use of the bandage on both legs.

CASE IV.

Patrick Curley, 50 years of age, was admitted into St. George's Hospital on the 17th of January, 1816.

He had a varicose ulcer on each ankle of the left leg, not less than one inch and a half in diameter. There was an extensive cluster of varicose veins on the inside of the leg, above the ulcer of the inner ankle; and a smaller cluster on the outside, above the other ulcer. There was also a cluster of varicose veins on the calf of the leg. He had violent pain in both ulcers.

January 18. The varicose vessels on the inside of the leg were divided in three places, in the same manner as in the last case. The operation occasioned considerable pain, which lasted for four hours.

January 21. On removing the bandages, the incisions made in the operation were found to have healed by the first intention. The ulcers appeared more healthy. They were dressed with strips of adhesive plaster. He did not leave his bed until the 31st of January. He was now free from all uneasiness in the inside of the leg; but had a good deal of pain in the other ulcer.

February 20. The ulcer on the inside of the leg, below the

divided veins, was almost completely healed. The ulcer on the outside of the leg was somewhat, but very little smaller. He complained of its being very painful, so as to disturb his rest at night. Three varicose veins were divided above, and one below the ulcer. The pain of the ulcer was immediately relieved, and he slept better on the following night, than for several nights previous.

February 24. He was unfortunately seized with erysipelas affecting the whole of the left leg, and attended with the usual constitutional symptoms. The erysipelas terminated in abscess, the matter of which it was found necessary to evacuate by three punctures in the foot and calf of the leg. When the erysipelas had subsided, the ulcer on the inside had been completely cicatrized for a considerable time: the ulcer on the outside was nearly cicatrized also. There were no evident remains of the divided varicose vessels.

From the result of the foregoing and of many other cases, I am induced to conclude, that the operation which has been described, may be frequently employed with great advantage to the patient. At the same time I wish to be understood as recommending the adoption of it, not indiscriminately, but with a due attention to the circumstances of each individual case. The cases for which it is fitted, are, not those, in which the veins of the leg generally are varicose, or in which the patient has little or no inconvenience from the complaint, but those in which there is considerable pain referred to a particular varix, or in which hæmorrhage is liable to take place from the giving way of the dilated vessels, or in which they occasion an irritable and obstinate varicose ulcer.

On the Laceration of the Fibres of Muscles, particularly of the External Gastrocnemius. By James Wardrop, Esq. F. R. S. Ed.

[From the Medico-Chirurgical Transactions, Vol. VII.]

There is an accident to which the muscles are occasionally liable, and though not unknown to some surgeons, I am not aware has ever been noticed by surgical writers. As I have observed a few instances of it, perhaps a short account of them may not be deemed unworthy of being laid before the Society.

It sometimes happens that muscles during violent action tear asunder their tendons, and they have been known to break through the bones to which they are attached. In the injury now to be described, only a few of the muscular fibres are torn, and as far as I have been able to observe, the laceration is most apt to take place near the part where the muscle becomes tendinous. This description of injury is not confined to any particular muscles; it is an accident by no means unfrequent, and it appears to me that many of those anomalous injuries of muscles, and injuries which have been often attributed to the lacerations of tendons, as of the plantaris longus, are of this description.

Perhaps there is no muscle so liable to this injury as the external gastrocnemius, and it can occur in few where the symptoms are so strongly marked, or where a proper treatment is of such importance; the limits of this paper will therefore be confined to a description of the injury of this muscle.

When any of the fibres of the external gastrocnemius are torn, it will always be found to be the consequence of some untoward or sudden action of the muscle; and the attention of the patient is called to it, by suddenly feeling a sharp pain in some part of the leg, most commonly at that part where the fibres become tendinous, accompanied by lameness. When the limb is examined, an inequality will be perceived at the

pained part, a distinct concavity being formed by the separation of the lacerated extremities of the muscular fibres. This part is very tender to the touch, and though, in a short time after the accident, the whole calf of the leg becomes more or less swelled and tense, yet the particular part, where the muscle has been injured, can always be distinctly pointed out by the patient.

The consequences of this kind of injury are extremely troublesome; a very considerable swelling with tension of a part of the limb come on, and the patient remains quite lame. These symptoms continue with little abatement until means are adopted to keep the lacerated parts at rest, so that the accompanying inflammation may subside, and a re-union of the lacerated fibres take place; for whenever the patient begins to move about, the tender parts are stretched; acute pain is brought on, and he thus becomes more lame. In this manner I have known patients suffer from the injury for several months.

The cure of this kind of injury is sometimes extremely tedious, particularly if, from early inattention, the necessary treatment has been neglected. The lacerated extremities of the fibres should be placed as soon as possible in contact, and carefully retained in that situation until they adhere. This is to be accomplished by relaxing the whole muscle, and preventing its extension to such a degree as would separate the ends of the torn fibres, until adhesion has taken place. The foot should be moderately extended, and the knee slightly bent. A strip of linen should then be placed on the upper part of the foot, carried over the toes along the sole of the foot, heel, calf of the leg, and over the bend of the knee, and part of the posterior part of the thigh. This is to be secured in that situation by means of a circular roller, extending from the foot over the whole limb. The bandage is to be worn until the lacerated fibres are completely reunited; and this will be known from the patient's acquiring a feeling of strength, and being able to throw the muscle into action without pain or uneasiness. In some cases adhesion has taken place in a few days, when the proper treatment was employed speedily after

the injury. In other instances it has required several months before the limb could be used.

The symptoms and treatment of this injury may be farther illustrated by narrating the following cases.

CASE I.

A gentleman, when going across a street, stopped quickly to avoid a carriage. At this moment he had a sensation in the calf of his left leg, as if it had been struck with a stone, or by some very hard body swinging in his pocket; and so strongly was he impressed with this feeling, that he was surprised, when putting his hand into his pocket, to find it empty. This happened late at night, and I saw him early on the following morning. The posterior part of the limb had by this time swollen considerably. At the spot where he first felt the pain, there was a great degree of tenderness to the touch, and it was unequal and knotty to the feel, with a distinct depression at one part. Any motion of the limb gave pain, and he was unable to rest the weight of the body upon it.

The limb was bandaged in the manner which has been described; and from being lame and unable to move without great uneasiness, he could put his toes on the ground and exercise that limited motion which the bandage admitted of, without pain. The swelling and tenderness of the limb abated daily, and in less than a fortnight he was able to use it freely without the bandage.

CASE II.

A muscular man, 40 years of age, when quickly running across a street, felt, to use his own expression, as if he "was shot on the leg." He became quite lame, and complained of acute pain at that part of the calf of the right leg where the muscular and tendinous fibres of the external gastrocnemius muscle unite. A good deal of swelling succeeded, and I saw him eight days after the accident. He was then very lame, complaining of pain in the calf of the leg, where a distinct inequality or depression could be perceived, and there was a

good deal of discoloration of the whole inferior part of the limb.

A bandage was applied in the usual manner; the pain and swelling subsided; and in ten days he was walking about with only a very slight lameness.

On the use of Nicotiana, in retention of urine. By HENRY EARLE, Esq. Surgeon to the Foundling Hospital.

[From the Medico-Chirurgical Transactions, Vol. VI.]

THE following observations on an efficacious mode of relieving some of the most alarming cases of retention of urine, will not, I trust, be devoid of interest to the Society; when the frequency of the complaint, and the difficulties which occasionally occur in the treatment of it are considered.

The facts in illustration of the practice are not numerous, but sufficient to warrant my laying the subject before the public, to be confirmed or confuted by subsequent experience.

The causes of retention of urine are so various, that it is not my intention to enter at large into the subject; more especially as the plan of treatment which I shall speak of, is only applicable to particular cases: I shall therefore confine myself to a brief consideration of the nature of such cases.

It is well known, that persons who have been long subject to strictures in the urethra, but who are still able to void their urine in a small stream, are liable, from accidental causes, to have a complete retention, and are incapable of expelling the contents of their bladder. This arises in some cases from the calibre of the urethra being still further diminished by attacks of inflammation, but more frequently from the spasmodic state of the muscles of the urethra.

The same effect may be produced in persons labouring

the injury. In other instances it has required several months before the limb could be used.

The symptoms and treatment of this injury may be farther illustrated by narrating the following cases.

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The limb was bandaged in the manner which has been described; and from being lame and unable to move without great uneasiness, he could put his toes on the ground and exercise that limited motion which the bandage admitted of, without pain. The swelling and tenderness of the limb abated daily, and in less than a fortnight he was able to use it freely without the bandage.

CASE II.

A muscular man, 40 years of age, when quickly running across a street, felt, to use his own expression, as if he "was shot on the leg." He became quite lame, and complained of acute pain at that part of the calf of the right leg where the muscular and tendinous fibres of the external gastrocnemius muscle unite. A good deal of swelling succeeded, and I saw him eight days after the accident. He was then very lame, complaining of pain in the calf of the leg, where a distinct inequality or depression could be perceived, and there was a

good deal of discoloration of the whole inferior part of the limb.

A bandage was applied in the usual manner; the pain and swelling subsided; and in ten days he was walking about with only a very slight lameness.

On the use of Nicotiana, in retention of urine. By HENRY EARLE, Esq. Surgeon to the Foundling Hospital.

[From the Medico-Chirurgical Transactions, Vol. VI.]

THE following observations on an efficacious mode of relieving some of the most alarming cases of retention of urine, will not, I trust, be devoid of interest to the Society; when the frequency of the complaint, and the difficulties which occasionally occur in the treatment of it are considered.

The facts in illustration of the practice are not numerous, but sufficient to warrant my laying the subject before the public, to be confirmed or confuted by subsequent experience.

The causes of retention of urine are so various, that it is not my intention to enter at large into the subject; more especially as the plan of treatment which I shall speak of, is only applicable to particular cases: I shall therefore confine myself to a brief consideration of the nature of such cases.

It is well known, that persons who have been long subject to strictures in the urethra, but who are still able to void their urine in a small stream, are liable, from accidental causes, to have a complete retention, and are incapable of expelling the contents of their bladder. This arises in some cases from the calibre of the urethra being still further diminished by attacks of inflammation, but more frequently from the spasmodic state of the muscles of the urethra.

The same effect may be produced in persons labouring

under stricture, by retaining their urine beyond the usual period for expulsion. Even in a state of perfect health, if we suffer the bladder to be over distended, whereby the muscular fibres are stretched beyond their natural sphere of contraction, every one has experienced that a greater effort is required, and the aid of the abdominal muscles is obliged to be called in, to overcome the resistance afforded by the neck of the bladder. This, I conceive, arises from the disturbance of that nice equilibrium which naturally exists between the expelling and resisting power. When disease has existed for some time in the urethra, and a permanent obstacle is afforded to the egress of the urine, the expelling power is exerted with greater force: the bladder consequently becomes thicker, more muscular, and contracts on a smaller quantity of fluid.

It happens not unfrequently, that the permanent stricture may be of such a nature as not to admit of the introduction of any instrument into the bladder, even under the most favourable circumstances. I need scarcely add, that a spasmodic state of the urethra would not facilitate such attempts. Other cases again occur, in which perhaps an instrument can be passed, when the urethra is in a more tranquil state, but where it would be highly injudicious, and often impracticable to introduce such instruments under circumstances of irritation, by which attempts the spasm would be increased, and the patient rendered liable to returns of retention, were we to succeed in the first instance.

In all such cases it is highly desirable to overcome the retention by other means than the introduction of instruments. For this purpose purgatives, general and local bleeding, warm baths, and tinctura ferri muriatis are commonly resorted to. With respect to purgatives, their action necessarily requires more time, than, from the urgency of the symptoms, is frequently admissible. The other remedies are highly useful, and will frequently fulfil every indication; occasionally, however, they are unavailing, and we are compelled to resort to operations for relieving the distended bladder.

In offering another powerful auxiliary to be adopted in cases which have resisted the ordinary means employed, I hope to

confer some benefit on society. The medicine to which I allude is the Nicotiana, to be exhibited as an enema, in the form either of smoke or infusion.

The powerful effect of this medicine in strangulated hernia, first led me to propose its administration in obstinate cases of retention of urine, in a paper on diseases of the urethra, which I drew up some years since for a Medical Society. I shall now proceed to relate the cases in which I have had an opportunity of ascertaining its effects.

In October, 1812, I was requested to attend Charles Wright, for a retention of urine, of which he gave the following history. When about eighteen years of age, he had suffered severely from gonorrhœa and hernia humoralis; from this period he dated the complaint in his urethra. He was now thirty-five: during this time he had been in a gentleman's service, as groom, and had been obliged to ride a great deal. The stream of water gradually diminished in size, accompanied with frequent and urgent calls, until about two years before the present period; when, from being obliged to remain a long time on horseback, he had a retention of urine, accompanied with so much inflammation, that an abscess formed in the perineum, which burst and became fistulous. For this complaint he had been for some time under a surgeon's care, who attempted to pass bougies, but never succeeded in reaching the bladder. He had latterly been in the habit of passing a metallic bougie for himself, which was the probable cause of the present retention and inflammation.

On examination, I found a firm obscurely elastic tumour, about the size of a pigeon's egg, situated immediately on the urethra, at the lower part of the scrotum. This was about the point to which he had been accustomed to pass the instrument. The surrounding scrotum was healthy, which led me to refer the present abscess rather to the irritation of the bougie, than to any effusion of urine, which generally diffuses itself more extensively. The abscess had been about three days in forming, accompanied by great pain and fever, and he had not been able to void his urine for the last eighteen hours. I immediately made a free incision into the abscess, and let

out about ʒiv. of very fetid pus. I directed him to sit in warm water, and ordered a common clyster to be thrown up. As he was still unable to make water after the trial of these means, I desired him to take fifteen drops of tinctura ferri muriatis every ten minutes, in barley water. He continued it for nearly three hours; the medicine produced nausea and headache, but still no water passed. I now attempted to introduce a bougie, but could not get beyond six inches; the introduction thus far was productive of great pain. His symptoms were now very urgent, for although the bladder was not greatly distended, yet from the long existence of disease it had probably become much thickened, and was very irritable. Apparently no alternative now remained but an operation; and as the bladder could not be satisfactorily felt above the pubes, and the perineum was much thickened and diseased, I determined in my own mind to puncture from the rectum. Previous, however, to resorting to this *ultimum remedium*, I was desirous of trying the effect of the Nicotiana.

With this view I procured some common tobacco, and not having any scales was obliged to guess at about two drachms, on which I poured a pint of boiling water. Eight ounces of the infusion were thrown up, and with some difficulty retained. After about ten minutes the patient became very faint and sick; a clammy sweat broke out over his whole body, his pulse became feeble and intermittent, and the urine began to dribble away to a considerable amount. The contents of the rectum were now suffered to come away, consisting of the infusion mixed with fæculent matter. As he still continued very faint, a small quantity of brandy was given, which quickly restored him. The effect of the Nicotiana in this instance was most decidedly beneficial, though the symptoms produced were certainly alarming, arising probably from the uncertain strength of the infusion. I continued to attend the patient for some time; the abscess in the scrotum was unconnected with the canal of the urethra, and healed without difficulty. After some days I commenced passing bougies; at first I could not get beyond six inches, but by a few applications of the caustic, I succeeded in passing a tolerable sized one about eight inches.

The fistulous opening in the perineum I laid open, and by a compress and sticking plaster, effectually prevented the further escape of urine. He was in every respect much relieved, and there was a good prospect of his ultimate recovery, when he was obliged to leave London, and I have never since heard of him.

The next case in which I tried tobacco, occurred about three months after, in a gentleman who had been for many years subject to strictures, and for want of proper medical assistance, had suffered the disease to proceed to a most alarming extent. When he first applied to me, he declared that he had not, for a long time, been able to sleep for the space of one hour, and he was frequently obliged to make water every quarter of an hour. His general health was much impaired by want of rest, and the continual irritation under which he laboured. Generally the water came away in a fine hair stream, but at times it passed *guttatim*. On examining his urethra, I found a stricture about four inches down, which I passed with a small bougie, but could not succeed with the finest in getting beyond six inches. After several ineffectual trials with common and catgut bougies, it became necessary to resort to the caustic. After six applications he was attacked with a retention of urine, accompanied with great pain and anxiety. All the common remedies were in turn resorted to: he was bled, clystered, placed in a warm bath, and took the tinctura ferri muriatis, but all failed in producing the desired effect. The success I had met with in the last mentioned case led me to resort again to the Nicotiana; an infusion of the strength of one drachm to eight ounces was made and thrown up. In about a quarter of an hour he became rather faint and complained of languor, and in a few minutes more the water began to flow from him. The effect of the medicine in this case was by no means so violent as in the former, but equally efficacious.

As I had evidently gained ground with the argentum nitratum, I again resorted to it, and after applying it thirty-five times, by cautious perseverance I succeeded in reaching the bladder, and freed my patient from all his sufferings. During

this period he was at two several times again attacked with retention, and was relieved by the tobacco infusion, to which I at once resorted, without subjecting him to the delay of other medicines.

The third case occurred in the course of last summer: I was sent for to attend a young man labouring under retention of urine. I found that he had been for years subject to strictures, but had always been able to void his urine until that morning; when, on rising, he was unable to discharge the contents of his bladder. He had been in the habit of passing a small whalebone bougie, which he now attempted in vain to introduce. He called on a neighbouring apothecary, who immediately attempted to pass a catheter, and used great force, which was followed by a copious flow of blood, but no urine. He was next bled from the arm, and some opening medicine was administered, and as he was still unable to make water, I was called in.

I saw him about three o'clock in the day, the retention having existed from the preceding night. He was still bleeding freely from the urethra, and had a most urgent desire to make water. I directed him to take the tinctura ferri muriatis, and to sit in a tub of warm water. He took 18 doses of the tincture without any perceptible effect but nausea. I now attempted to pass a bougie, but when about eight inches down it quitted the right tract and was readily detected, by introducing the finger per anum, passing between the bladder and the rectum. I immediately withdrew the bougie, which had caused much pain, though introduced with the utmost care and gentleness, and ordered an infusion of Nicotiana, of the strength of one drachm to eight ounces, to be used as an enema.

I was under the necessity of leaving him, to visit a patient a short distance from town, but on my return, in less than two hours, I was informed that a short time after the injection he had been very faint, and had perspired copiously, during which time the urine flowed from him in a stream.

I directed him to keep quiet, and, whenever he made water, to press with his hand on the perineum, to prevent, if possible, the escape of any urine by the false passage: he had no re-

turn of the retention, and by the above precaution had no effusion of urine. It is most probable that in this case the retention was kept up, and symptoms aggravated by the injudicious introduction of the catheter in the first instance, without resorting to any other means. As the urethra had been pervious to the passage of urine the preceding night, it was evident that the complaint depended on spasm, which might have been relieved by warm bathing, or the cautious introduction of a bougie. Should such a case occur to me in practice, I should be induced to try the injection of warm olive oil into the urethra, as I understand that this plan has been very successfully adopted in Italy, in cases of retention arising from spasm combined with permanent stricture.

These are the only instances in which I have had an opportunity of trying the effect of the Nicotiana in retention of urine. I have ventured to detail the cases, as illustrative of three different causes of retention, each, however, corresponding in the impracticability of the introduction of instruments, and each having resisted the ordinary modes of relief.

The operation of Nicotiana varies much in different individuals, and is influenced in some degree by the habit of smoking or chewing tobacco. It generally acts very powerfully, and I have known it produce most alarming syncope; it ought not, therefore, to be adopted indiscriminately in slight cases, but reserved for instances where more simple means have failed. It is, probably, in consequence of the occasional violence of its action, that medical men have been deterred from using it, except in cases of strangulated hernia, as I am not aware of its having been before tried in retention of urine.

Its virtues as an antispasmodic are so eminent, that I was induced to try it once in a very bad case of tetanus, in which, although it afforded a temporary alleviation from spasm, the exhibition of the enema caused so much agitation that it was not persevered in. Should such a case occur again, or should I happen to meet with a case of hydrophobia, I should be much inclined to try the effect of an extract of Nicotiana made into a suppository and placed up the rectum. This form of admi-

nistering the medicine would embrace many important advantages. Its strength might be better regulated than by an infusion or the smoke. It would produce little or no irritation; it might be easily removed if found to operate too violently; and, lastly, if its effect were salutary, it might be retained for a much greater length of time than the injection. As the case to which I have just alluded was attended with some peculiarities, the particulars of it may not be unacceptable to the Society, though unconnected with the present subject.

Case of Tetanus.

Joseph Owen lacerated his great toe with a block of wood. There was nothing remarkable in the appearance of the wound, which was granulating; when, on Tuesday, Feb. 26, about three weeks from the receipt of the accident, he was seized with pain and stiffness in the muscles of his back, and was troubled with severe cramps in his legs and thighs. These symptoms rapidly increased in violence, and in a short time his jaw became affected; the muscles of the abdomen and neck afterwards partook in the affection. In a word, all the voluntary muscles were affected with tetanus. I found him in this state with a countenance expressive of the greatest terror and anxiety; his pulse was strong and full, beating about 140 in a minute, and his whole body was covered with a profuse sweat. I immediately bled him to the amount of twenty ounces, and gave him pulveris ipecacuanhæ comp. gr. xv. calomelanos gr. v. The spasms were much relieved by the loss of blood, were less frequent, and of shorter duration. A physician who now saw him, ordered him to take large quantities of wine and sago, and to continue taking the pulv. ipec. comp. gr. v. omni bihorâ. The wine aggravated the complaint so much, that its use was soon discontinued. I now tried the enema of tobacco smoke, the result of which has been related above. Towards night the spasms were again very violent, and ten ounces more of blood were taken away, after which he appeared much easier; his pulse became softer, and he broke out into a profuse sweat; the muscles of the abdomen

relaxed, and were evidently affected by respiration. The blood which had been drawn in the morning was most remarkably buffed and cupped. The following morning I found him much better, and he had slept for some hours in the night. He had not passed any fæces, and felt very desirous of easing himself, but was prevented by the spasmodic affection of the muscles whenever he exerted himself in the slightest degree. I directed him to have clysters with oleum ricini thrown up, which returned without any fæculent matter. He experienced much difficulty, and an aggravation of the spasms whenever he attempted to make water, which was small in quantity and very turbid. He was so much worse towards evening, that twenty ounces more blood were taken from his arm, which again procured him ease and some sleep. In the course of the night he passed a fluid stool; the following morning, his pulse being still full and hard, and the spasms being occasionally violent, though much less frequent, I took twelve ounces more from him. He experienced so much ease after each bleeding, that towards evening he requested to be again bled, being persuaded that it was the only means of obtaining a quiet night; accordingly twelve more ounces were taken. He passed a tranquil night, and slept three hours at one time; early in the morning he had three copious evacuations. He was now considerably better in every respect; his pulse was much softer, and he was able to take some nourishment; his countenance was less anxious, and he no longer talked of dying. During the day he was much agitated by his relations coming to visit him, and at night it was necessary to bleed him to the amount of sixteen ounces. On Saturday morning he was much better; he had slept a great deal during the night, and was much refreshed. He said that he felt much improved, but very weak. Some arrow-root and jelly with a little wine were given to him; but the wine reproduced the spasms, so as to render it necessary again to have recourse to the lancet at night. All Sunday he was so much better that I entertained confident hopes of his surviving; the principal pain he complained of was across his back and belly, and in one thigh. On Monday he continued to improve; but unfortunately his friends paid

him another visit, and at his request gave him some porter, which reproduced the spasms, but in a much diminished degree. Towards evening he complained of weakness, his countenance had changed much during the day, his pulse became very frequent, and when sleeping he rambled a little. During the night he sunk rapidly, and the following morning expired. The blood, to the very last, exhibited the strongest marks of inflammation.

Dissection.

Nothing particular was found in the head; the veins of the pia mater were rather turgid with blood. The thoracic and abdominal viscera were healthy. On the surface of each psoas magnus muscle there was an effusion of blood, on removing which the muscular fibres were seen much lacerated and altered in texture, being quite soft and giving way under the fingers. This lacerated appearance occupied nearly the whole thickness of the muscles to some extent. A similar effusion of blood had taken place in the sheath of the right rectus abdominis, and the muscular fibres were torn and quite soft, like the muscles of an animal that had been hunted to death.

Though this case terminated fatally, I conceive that the appearance of the blood and the remission of pain on bleeding, fully warranted my prosecuting this plan. The muscular fibres being actually torn asunder, sufficiently prove the violence of the attack; and I think, that although I was not so fortunate as to preserve his life, I rendered his severe sufferings more supportable. Blood-letting in tetanus has been much censured by different authors, but I must hesitate in subscribing to their opinions, which I conceive have been formed without sufficient trial, or rather, which have been adopted from one generation to another without the acquisition of any new facts. I am induced to form this conclusion from meeting with the following passage in Cullen. He says, "Blood has often been drawn in this disease, but it never exhibits any inflammatory crust, and all accounts seem to agree that the blood drawn seems of a looser texture than ordinary, and that it does not coagulate in the usual manner."

Now either the case which I have just now related was anomalous, or Cullen has adopted opinions without sufficient grounds. As I do not possess any other facts on this head, I cannot pretend to decide on the subject, but scruple not to declare, that should such a case again occur, with as much arterial action, and with such appearances of the blood, I should certainly adopt a similar line of practice, combined with the use of the Nicotiana.

On the Mode of Ventilating and Warming the Infirmary at Derby. In a letter to the Editor.

[From the Journal of Science and the Arts, No. III.]

Sir,

The Derbyshire General Infirmary being celebrated, both at home and abroad, for the peculiar conveniency and economy of its arrangements, and for many valuable improvements, by which the objects of such an institution are more successfully accomplished than in any other hitherto established, particularly as it relates to the uniform temperature diffused through the whole house, accompanied by a copious ventilation, a short account of this establishment, and of the means by which it has been accomplished, may not be uninteresting to your readers, especially as this subject has of late become of general interest.

This building is of a cubical form, and consists of three stories. The basement contains the offices, two public warm-baths, a steam engine, and the warming stove. The middle story, the household part; and the upper story is entirely appropriated to the patients. This is divided into two parts for males and females, each consisting of a certain number of wards of different sizes, containing beds, and a large room occupied in the day by the convalescent patients. A certain part of each story is completely insulated from the rest for the reception of fever patients. This part has a separate

entrance, with offices and every convenience, so as to preclude the necessity of any communication with the other parts of the house.

The apparatus employed for warming the building was invented by W. Strutt, esq. of Derby, in the year 1792, and has been extensively used by him for various purposes ever since that period. In adapting it to the above institution, the inventor connected with it a more perfect means of ventilating than had hitherto been adopted, securing at all times a constant change of air in every ward, independent of the casual openings of the doors and windows.

The stove is placed about twenty feet below the patient's story, and is calculated to warm a large quantity of air, while it is passing through it immediately from the atmosphere. The air derives its heat from an iron vessel about four feet square at the base, and six feet high, the top part being arched, forming a groin. This vessel is placed with the mouth downwards over a fire place, so that the interior surface may be constantly exposed to the flame and radiant heat. The smoke escapes through a narrow opening under the flange of this vessel into a flue on each side, which afterwards unite and pass into a chimney. All this part, as well as the ash-pit and fire-place, are carefully secured against any communication with the exterior parts of the vessel; which is intended to heat the air for warming and ventilating the rooms.

This vessel is formed of wrought iron, riveted together in the manner of steam-engine boilers, and is called *the cockle.* The room in which the exterior of this vessel is exposed, communicates with a subterraneous passage, about four feet square, and extending to about fifty yards from the building. From this point a perpendicular shaft arises to about twelve or fifteen feet above the surface of the ground. This opening is terminated by a cowl or turncap, provided with a vane, which has the effect of keeping the entrance for the air always presented to the wind. This entrance insures a current of air towards the stove equal to the velocity of the wind. I will now explain how the current of air is determined to the cockle, on its way to the different rooms to be warmed.

The cockle is surrounded by a brick wall of nine inches, leaving a cavity between the wall and the cockle about nine inches wide. In this wall are left square openings of about two inches, opposite to the iron surface. These holes are distant horizontally a brick in breadth, and perpendicularly a brick in thickness; each of these square holes contains a square tube made of rolled iron, extending the opening to within about half an inch of the side of the cockle. This wall with openings and tubes at similar distances extends to the very crown of the groin, the brick-work being groined of the same shape as the cockle. The number of holes and tubes in the whole surface is about 600.

The lower half of these tubes are for the admission of cold air, which strikes the cockle perpendicularly to the surface. The upper half of the tubes are surrounded by a chamber which contains the hot air, and of course is completely insulated from the rest of the room. When the cold air enters the lower portion, it first strikes the hot cockle, and then rises into the upper cavity, from which it cannot escape but through the upper set of tubes into the hot air chamber; but before it enters these tubes it must make various eddies, by which it will be often brought again in contact with the upper part of the cockle. By this means the air is made to carry off the greatest possible quantity of heat: this will also depend upon the velocity of the current, which is as the square root of the height through which the heated air has to ascend, before it is delivered into the rooms.

From the hot air chamber the air is conveyed by a vertical funnel up to the level of the patient's story; from this point it is conveyed by horizontal flues to the different rooms. The area of the section of the perpendicular funnel is about 7 feet, and the average velocity of the air is about five feet per second, at the temperature of 130°, allowing the average temperature of the air in winter to be 40°. This is when the fire of the stove is moderately kept up, and when it would consume from three to four cwt. of coals in twelve hours. This stove, if the fire was kept up night and day, would keep 200,000 cubic feet of space at 60° in the coldest part of the

season; the rooms not exceeding ten feet in height. The openings from the flues into the different rooms are provided with registers, to adjust the quantity of air required to produce the limited temperature, which is 60°. The outlet from each room is a common chimney. The whole of these terminate in the roof the building. The foul air which they bring escapes into the atmosphere through a turn-cap similar to that through which the air enters, with the exception of the aperture being always presented from the wind, by placing the vane on the same side as the aperture.

In the summer season the air passes through the same flues as in winter, but the foul air escapes at the top of the room instead of the bottom. The subterraneous passage being about the temperature of the earth, cools the air in summer, and gives to it a certain degree of heat in winter which economises fuel.

Mr. Sylvester of Derby, from whom I have obtained these facts, will very soon publish a particular account of this method of warming and ventilating, with working plates engraved by Mr. Lowry. The same work will embrace many other valuable improvements belonging to the same institution, with their application to similar public buildings, churches, private dwellings, and manufactories.

Some account of a contrivance, which was found of singular benefit in stopping Excoriation and Ulceration consequent upon continued pressure in bed. By W. Heberden, M.D. F.R.S. Fellow of the Royal College of Physicians, &c.

[From the Medical Transactions published by the College of Physicians in London, Vol. V. 1815.]

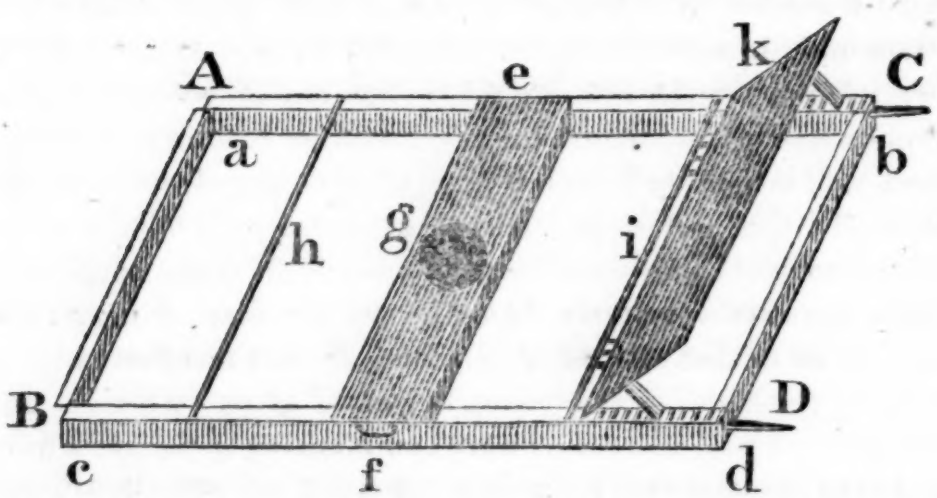
As the ultimate object of the medical art is the removal, or alleviation, of those evils to which the human body is exposed, I make no scruple of laying before the College of Phy-

sicians, some account of a contrivance, from which I have lately experienced great benefit; though strictly speaking, the calamity be no disease, and the remedy no medicine. There is no one in the habit of attending the sick, but must have had reason to deplore the wretched condition of those, who being bedridden through accident, or infirmity, have contracted sores of a very painful and dangerous kind by long pressure, especially if the patient lie in the wet and filth of his own body which he is unable to restrain.

In the month of November last, a lady above four-score years old, in a declining state of health, was seized with a hemiplegia; which, besides the extinction of voluntary motion on one side, was accompanied with an inability to articulate, and a total unconsciousness of the natural wants of the body. In this sad state she was attended with all the care, which an apprehension of the evils likely to ensue could suggest; the skin was preserved entire for the first fortnight; but at the end of that time, notwithstanding all the efforts to prevent it, the bedding and room began to grow offensive, and excoriation and ulceration were commencing in the parts most exposed to the superincumbent weight of the body, and the fermenting steams of the bed. The mischief seemed to be rapidly increasing under the unfavourable circumstances of a helpless old age, when the contrivance I am going to describe was adopted; by which the sick chamber was immediately rendered sweet and wholesome, the ulceration ceased, and in less than six weeks the sore places were perfectly healed, and covered again with a sound skin; though the disabilities of all kinds, which had originally occasioned the malady, continued without any abatement for more than three months, for so long was the life protracted. It may be questioned, how far the delaying of the final stroke deserved the name of a blessing under such sad circumstances. The freedom from the pain and misery of an extensive sore and mortification are at least blessings of no trifling value; and in this case must be attributed, under providence, to the use of the machine, of which an explanation is subjoined.

In the hope that other sufferers, from so distressing and by no means unfrequent a calamity, may derive equal advan-

tages from the adoption of a similar plan, I have thought I might render an acceptable service both to physicians and patients, by making this more generally known. It is no little recommendation, that it is very simple, is applicable to all beds, and is of so easy construction, that in the instance, from which I have drawn up this account, it was completed, and fit for use, within ten hours from the time it was ordered. In the following figure A B C D represents a frame, or rather the upper



surface of a frame, of which *a b c d* is the corresponding surface about six inches below: *h* and *i* are cross-bars for the purpose of strength: *e f* is a drawer, made to pull out on either side, containing a pan, which, when the drawer is in its place, lies immediately under the opening *g*, and is intended to receive every thing that may pass from the body: *k* is a sort of desk for the convenience of raising the patient's head. At A and B is made a notch to receive the front bedposts: at C and D are projections to go on each side the back of the bed in order to keep the frame more steady. Upon this frame is fitted a mattress with a hole in the centre corresponding to the hole *g*, and divided at *i*, so that one part of it may be raised by the desk of the frame without moving the remaining part from its situation. The under blankets and sheets have likewise a hole cut in the middle. To the mattress it was afterwards found convenient to add a loosely stuffed circular cushion immediately to surround the hole; which, not being fixed, could without difficulty be changed, and washed

as often as it was found requisite; and still more effectually to prevent the bed from being soiled by the casualties incident to a protracted illness, a piece of oiled silk was sewed round the opening in the mattress. In order to use it, it is obvious that nothing more is necessary than to remove the ordinary bedding, and to let this frame with its mattress rest upon the bedstead. The machine would perhaps be rendered more complete by the addition of a foot-board, whenever it should be applied to a bed, which had not one already attached to it. This will have considerable effect in preventing the body from slipping too forward on the hole, when the mattress, from the continued pressure, begins to sink in that part.

Some Observations on the Pathology of Insanity. By George Man Burrows, M. D. F. L. S. &c. London.

[From the London Medical Repository, for October, 1816.]

Insanity in every form is a disease the most afflicting in its consequences on social happiness of any to which mankind is subject. To detail what these consequences are, is quite unnecessary:—they are felt by all ranks, and in all civilized countries, and in none more extensively than in this kingdom. This disorder, which at once deprives man of his highest attribute—reason, and degrades him among created beings, may be traced to very remote periods; for we find all its well known effects interwoven even with the fabulous history of the Heathen Mythology. It is distinctly treated of by the most ancient Greek and Roman, as well as Arabian authors, who professedly wrote on medicine, and by many philosophers who have noticed it among other phenomena in man.

The moderns have supposed that they are less happy than the ancients in the treatment of this disease. For this retrogression in therapeutics, I know no particular reason assigned; except it be, that the hellebore, the favourite remedy of the ancients, now employed, has not the same qualities as that which grew in Anticyra.

As experience evinces that the improvement in the treatment of insanity is not commensurate with that perfection in the therapeutic art of which the moderns boast, it may be useful to investigate the causes of this defect. The limits to which it is requisite to confine myself will not here admit a full discussion of the subject. But there are many facts sufficiently obvious, and well worthy of notice, which may throw light upon it; some of which, with great deference, I submit for consideration.

The fathers of physic had but a very confused knowledge of physiology: hence their pathology of diseases was often erroneous; their practice being of course guided by the opinions on these subjects which then prevailed. Their system of pathology is contradistinguished from others that have since flourished, as—the humoral pathology. According to this, all diseases originated in the condition of the humours of the body: a redundancy of yellow bile was the supposed cause of mania; and black bile, of melancholia. But as all disorders affecting the mental faculties had, in superstitious times, a peculiar degree of interest, we find that researches into their causes were not omitted. Human anatomy was then rare: and comparative anatomy was resorted to on most occasions of experimental inquiry. Hippocrates says,* he visited Democritus, to judge of his sanity, at the request of the citizens of Abdera, who thought him mad. He found the philosopher dissecting animals, in order that he might examine the liver, and endeavour if, in the nature of the bile, he could discover the cause of insanity.

The labours of the numerous learned and industrious anatomists and physiologists who have flourished within the last century and a half, have greatly extended our knowledge of the animal economy: they have likewise corrected many former errors, and much enlarged the limits of pathology.

The ancients had not these advantages; and therefore probably were more exact observers of the diagnostics of diseases, and more strictly attended to those clinical duties which so eminently contribute to form good practical physicians.

* *Epist. Hippocrates Damageto*, sect. 8.

They had remarked what, I believe, if not always, is more frequently true, that in all cases of insanity, the biliary secretions are in fault, and sensibly changed. Hence they considered vitiated bile as the cause of this disease. They were not aware that such changes resulted from a morbid action in the liver—the organ by which it is secreted; and that, if this viscus be restored to its healthy state, the bile would be natural in its appearance, and be regular in its quantity.

Whatever credit may be given to the opinions of the ancients relative to the cause of mental derangement, none who read their writings will dispute the accuracy of their description of its symptoms. Hippocrates, Celius Aurelianus, Celsus, and Galen, are very comprehensive; but Aretæus will probably never be surpassed for minuteness and truth of delineation.

For almost eighteen centuries, the theory of this disease, and the practice in the treating of it, remained nearly stationary. Indeed, I do not remark any writer, till within a century, who has advised any thing strikingly novel, or who has suggested any thing more than the ancients. Nay, perhaps I may advance another step, and state my suspicion, that the farther we have deviated from the rules of practice they laid down for the treatment of insanity, the more unsuccessful has been the practice, and the fewer the cures that have resulted.

Contemplating the progress of medical knowledge, it does certainly appear not a little singular, that, in a disease involving all the dearest interests of society, so little exertion has been made to elucidate the cause, or improve the medical treatment of it. This is a real reproach on modern medicine.

Many English writers in particular, exploding the old humoral doctrine of pituita, or yellow or black bile, as exciting causes, have considered insanity as an idiopathic disease of that organ whence is derived sensation and volition: and as the brain is inferred to be the seat of the sensorium, it is consequently the focus and radius of insanity. In support of this hypothesis, many physiological experiments have been instituted, and much ingenious speculation has been hazarded; but, unfortunately, the deductions have been so intertexed with metaphysical dogmas, that ordinary minds, guided by

the induction of facts alone, have been embarrassed and bewildered; and have shunned the investigation, and even the treatment of the disease, as involving mysteries they cannot comprehend: while the nosologist, in his fondness for system, has amused himself with fanciful arrangements, assuming that the aberrations of a disordered reason were the real phenomena of specific diseases.

Even inquirers, who wisely sought for the causes of diseases from morbid examinations, have entered upon and conducted their researches with minds fettered by certain preconceived and favourite hypotheses; and have confined their examinations to those parts only, where they have *pre-supposed* insanity to have originated.

But why should the physiologist decide that the brain alone is the seat of the sensorium, and that thence sensation and volition is derived; or that it is the seat of the sentient principle, or of our perceptions or ideas; and that its integrity is essential to these operations? Have not morbid examinations disclosed, that all the functions, generally ascribed to the brain, have been actually performed when the texture of the brain appeared to have been almost destroyed?—or where great lesions or derangements of that viscus have been discovered in persons after death, in whom nothing to excite a suspicion of organic disease had been detected while living? And why should the pathologist presume that the derangement of the intellectual powers, or alienation of mind, emanate from certain morbid appearances he observes in the cranium, when similar appearances have been remarked in the crania of persons who died of other and very opposite diseases?—or why should he conclude that insanity is consequent upon lesions or derangements of the contents of the cranium, when, in many persons who have died mad, no sort of lesion or derangement, or vice of formation, could be discovered in their skulls? Yet such are the facts; and they are too numerous to require citing. If, then, a person can live, possessing and exercising all his faculties, in whose brain a lesion, or a great state of disease be found, it is decisive that a whole and sound brain is not indispensable for regulating all the functions of the animal economy; and that insanity is not an absolute consequence. If

one fact only of this kind be but proved, all the fine-spun hypotheses of the metaphysicians vanish; and we must look elsewhere besides the brain for the causes of insanity.

I by no means intend to infer that the seat of insanity is never in the brain. On the contrary, I hold it very possible that such a morbid state of those parts may, exclusively of injuries, be induced, by the continuance or succession of morbid actions, as to occasion derangement of the mind. But then this is an effect; while the cause, perhaps, is seated in some diseased and quite distant organ: and this effect may remain when the cause itself has ceased. Recovery from insanity sometimes happens without any medical means being applied. But when a person is insane, the moral, and the dietetic regimen being properly attended to, the primary cause of his insanity, especially if in the chylopoetic viscera, may thereby be removed; and the brain, which has been sympathetically affected, gradually resumes a healthy action. Organs, slightly deranged in their functions by disease, are soon restored to health: but if the attack be often repeated, a morbid action is excited, and goes on; and, at length, in spite of every attention, is often irremediably fixed. Thus it is well known, that in all incipient cases of insanity, the prognosis is favourable, except where it is the consequence of an organic injury; and that it becomes more unfavourable nearly in a ratio with the frequency of the attack.

It is acknowledged that the brain is the origin of the nerves; and the nerves may convey the impulse given them, as the chords of a musical instrument conduct sounds; but this does not imply that sensation is communicated only when it is applied to the origin of the nerves—the brain. Sensation may be communicated to the nerves from their extremities, as well as from their sources; and be directly carried from one part to another by some branch of those plexi of nerves which intersect and connect all points, and produce, by consent, a certain feeling over the whole of the body, or to any particular part of it, which we denominate sympathy. Perhaps we know not how to define sympathy; yet it is by sympathy of parts only that we can account for those anomalous symptoms which occur and perplex in the treatment of diseases.

Many modern writers have most forcibly and judiciously commented upon the connection by sympathy between the brain and the chylopoetic viscera, and have observed, that whether the primary disorder be seated in the one or the other, there is a reciprocal sympathetic action; and, that at length the functions of all the consenting parts may become deranged. But although the moderns have more generally insisted on the influence of sympathy, and amplified upon it; yet the ancients appear also to have been apprized that much is often to be imputed to this as an occult source of many otherwise inexplicable symptoms.* Hence many useful practical hints have been gathered; but it is to be hoped that the origin and nature of morbid sympathies will, from their great importance, be much more closely investigated.

Considering the morbid appearances which are detailed by British and foreign authors, who have directed their researches with a view to the enlightening of the pathology of insanity, and which must be accepted as proofs, at least, of industry; it is very extraordinary that all should pursue the same course of inquiry, regardless of the inutility, in a practical point of view, of the labours of their predecessors and contemporaries.

One pathologist only shall be quoted, although the remark applies generally, as an instance of how much talent and time maybe fruitlessly wasted when the mind enters upon inquiry, prejudiced: *John Ernest Greding*, physician to the workhouse at Waldheim in Saxony, dissected the bodies of some hundreds of maniacs: he gives a very accurate account of all the morbid appearances he met with in the cranium, and in the thorax of each body; but he actually neglected the examination of the viscera of the abdomen!† Here were presented opportunities of acquiring the most satisfactory information, if they have corporal existence, as to the causes of insanity. How much have humanity and science to lament this omission!

* Nonnullos verò et corripit à nervis procul à capite positis incipiens, quicunque principium *in consensum* affectus inducunt.—*Aretæi de Causis et Signis*, lib. i. cap. 5.

† *Appendix to Dr. Crichton's Inquiry.*

I have diligently consulted every accessible authority to supply the defects of Greding. Some detail dissections of maniacs; but the impression that the cause of the disorder is in the brain, has so much pervaded and influenced the examinations, that they have been almost entirely confined to the head and the thorax. This oversight applies equally to Bonetus, Morgagni, &c., as well as to more recent pathologists. May we not, therefore, fairly ask, if the deficiency of our knowledge of the causes of insanity proceed not from too much refinement?—or if physiologists have not been too speculative and metaphysical?—or pathologists too prejudiced?—or nosologists too fanciful?—and if moralists also have not been too hypothetical? If these doubts be affirmatively answered, shall we not have reason to conclude that our success in the treatment of insanity has not equalled that in other diseases, because our inquiries have not been conducted on sound philosophical principles?

I have recently inspected the bodies of five insane persons: two of them died in a state of mania; one of these died in convulsions; and three were afflicted with melancholia. The head of him who died of convulsions presented every appearance of too great determination of blood; a small portion of which, as well as some water, was effused between the dura and pia mater; there was also a little brownish-coloured water in the ventricles. In the other case of mania, there was no mark of disease, except that the vessels of the dura mater were a little turgid. Both these patients had been at first melancholic. In one of the cases of melancholia, there was no vestige of disease in the head. In the other two, there was water in the lateral ventricles. In all the five *the liver was diseased;* and mostly on the concave side; but there was only one in whom it was at all enlarged.

But although they who have examined and described the morbid dissections of the insane, have so generally either quite overlooked, or have been entirely silent on the condition of the liver, yet Dr. Cheyne of Dublin, in his admirable Observations on Apoplexy (p. 178,) mentions a circumstance that almost tends to establish a constant state of hepatic disease accompanying mental derangement: he says, that Mr. Todd,

Surgeon to the House of Industry in Dublin, found the liver more or less diseased in upwards of four hundred maniacs and idiots, whose bodies he had examined! Dr. Cheyne judiciously remarks, that this fact may throw a ray of light on the mystery in which the cause of insanity is involved. With this opinion I cannot but perfectly accord; and conceive it must have the same weight with others as I confess it has had, conjointly with some experience, on my mind. But even this, conclusive as it is, has, I understand, led to no result proportionate to its relativeness and importance.

Many have attributed the causes of insanity to some defect or alteration in the sanguiferous system; but it does not appear that they who support the doctrine, have attained any greater degree of success in the cure of it.

That insanity, therefore, originates more generally in a corporeal cause, than is allowed, is, I think, clear.

If the cure be more precarious and rare since the present rationale has been adopted, it is surely imperative to inquire most seriously into the causes of the failure, and to substitute any other that has the guide of reason, and the experience of the past.

Without any predilection for the humoral pathology of the ancients, yet, surely it may be admitted, that when they supposed bile, either in a redundant or deficient quantity, and atrabilis, or bile in a vitiated state, were exciting causes of insanity, they were not so much in error as the moderns might, from their own views, be led to imagine. Consonant with their reasoning, their plan of cure was judicious; and, assuming it as fact that the liver is greatly in fault in the majority of cases of insanity, the system of evacuation, friction, bathing, gestation, occupation, and temperance, duly enforced, was the most likely that could be suggested to obtain a cure. By steadily pursuing this practice, it is not improbable that the ancients were really more successful in the treatment of this disease than the moderns.

We daily witness many symptoms that give no indication of their origin; and for which it is with great difficulty, or we cannot at all account; but which are eventually traced to some derangement of the chylopoetic viscera; and most frequently

to that of the liver. Dyspeptic symptoms ensue; and if the cause be not detected, or be neglected, it is not uncommon for a train of other symptoms to follow, which form the true hypochondriasis—a disorder which is very properly classed by Sauvages and others, though not by Cullen, among the *vesaniæ*. This, at length, often terminates in decided melancholia: upon which, mania, also, frequently supervenes. But the latter often occurs without any precursory symptom of its approach. In the two former diseases, almost always—and, in the latter, generally—the appearance of the fæcal evacuations strongly denote the morbid action of the hepatic and alimentary functions.

As soon as the state of the patient will admit, but which cannot be accomplished while very violent, I have accurately examined the epigastric and hypochondriac regions; and I have generally had clear demonstrations, either by the expression of uneasiness on pressure, or from tension and fulness, that the liver was not in a sound state. Pain about the præcordia, commonly, and symptoms of dyspepsia, or of a morbid appetite, have universally preceded the attack. Some have complained of actual pain in the head; others, of a weight; others, of vertigo, or confusion. The tongue, in all the cases both of mania and melancholia, was always foul, and generally coated with a viscid phlegm.

Conformably with my own deductions, my practice in cases of insanity has been regulated; and I will add, that the result has been most satisfactory. But as my present design is rather to point out what I humbly conceive to be the great error in investigating the pathology of insanity, than to discuss either the diagnosis, or the curative means to be employed, I shall only venture to state, generally, that eleven out of sixteen cases of melancholia, since March, have completely recovered: nine of which were disordered for the first time; two had been repeatedly ill. Six of these commenced with mania, but soon sank into a low state. Some cases, which have since occurred, I do not notice, because the time is not sufficient to form any judgment on the event.

The alvine excretions in every case were very different to those of healthy persons. In twelve of them the stools were

dark, and exceedingly offensive. In four they were of a clay-colour, indicative of obstruction of the biliary secretion.

In cases of pure mania I have not been so happy; and, although some have recovered, I must candidly confess that I have attributed the fortunate issue more to Nature than to the means I have employed. The diagnostic marks of disease of the abdominal viscera, have not been so prominent in any of the maniacal as in the melancholic patients; although the alvine discharges bore almost always a very morbid appearance, and the peculiar odour.

It has been asserted by many who have had the care of the insane, that they are commonly insensible to temperature; and that the *primæ viæ* are difficult to excite. As a general law, I must contradict this position. Apathy to surrounding objects is frequent: but I have never yet seen an insane person that did not appear in some way or other sensible of great hanges of temperature. Constipation is certainly common. But I am confident it would prove highly injurious, if a practitioner were always to prescribe with the impression of torpidity of intestinal action: it is therefore better to act with caution. Still I am of opinion that all medicines in mania may be usually administered in larger doses than in any other disorder; and I am persuaded that the medicaments prescribed more often fail from the smallness of the doses given, than from the paucity or the inefficacy of the pharmaceutical remedies which we possess.

In medicinal remedies we have a great advantage over the ancients: the virtues of foxglove and mercury, and many active chemical preparations were unknown to them; which now justly rank as powerful auxiliaries in the cure of insanity.

That the moral means which the good sense and humanity of the moderns have so happily devised and applied, must be highly useful in many, nay, in most cases, is indisputable; but they ought not to be wholly relied on: they are adjuncts only to the medical means indicated. It is a great fault, and very much to be lamented, that the moral remedies are not of readier access, and rendered applicable to every situation where insane persons are placed.

I am aware that these succinct and cursory observations

will little elucidate this intricate subject; but they may be serviceable by attracting greater attention to the pathology of insanity—the only sure guide to a more successful *methodus medendi*. In this sketch, however, I have endeavoured to show the probability, that insanity often, if not usually, arises from sympathy with parts morbidly excited, and distant from the brain; and that this action is reciprocally exerted; and therefore that the causes of the derangement of the intellectual functions should not be sought for within the cranium only.* Besides, the success attending the treatment of insanity by the ancients is a direct illustration of the truth of this theory.

Possibly I may entertain other opinions regarding insanity, which will by many be deemed heterodox and untenable. In all cases of doubt it were better to consult the judgment of others. I shall not, therefore, hesitate submitting mine to the ordeal of the profession: I conceive:

1. That insanity, in which mania, melancholia, hypochondriasis, and all the species and varieties of nosologists are included, is never an idiopathic, but always a symptomatic disease.

2. That the diseased appearances found in the skulls of maniacs is an *effect*, not a *cause;* but that the effect may remain when the cause has ceased.

3. But that morbid alterations of the contents of the cranium do not always take place in maniacs; and when such are visible on dissection, they are the consequences of inflammation, congestion, or injuries from blows and wounds; or from sympathy with some derangement of the thoracic or abdominal viscera.

4. That whether such morbid alterations arise from diseased viscera, inflammation, congestion, compression, or malconformation, or any other exciting cause, synchronous effects may be produced on the sensorium, and consequent derangement of intellect ensue.

5. That incipient insanity will be most readily and more frequently cured, by applying the remedies to restore the healthy functions of the chylopoetic viscera, except there is another distinct and obvious cause: but where there is evident

* *Verum præcipua furoris et melancholiæ sedes viscera sunt.—Aretæi de Causis et Signis Morb. Diuturn*, lib. 1. cap. vi.

injury, great excitement, or congestion of the brain, applications and remedies, with a view to relieve, and as preliminary or as adjuncts to other means, may be of great use.

6. That a proper application of moral means may be highly conducive, combined with the physical, to the restoration of a sane state of mind.

7. That hereditary insanity, as it is called, is the consequence of some peculiarity of the animal frame, which may be propagated like any other vice of form in man or other animals.

8. That this disposition may remain latent, and never be displayed, provided no direct exciting cause be applied.

9. That this disposition may be modified or extenuated by crosses with families, in whom it does not exist; and may lay dormant for several generations; precisely as we see in breeds of domestic animals, which can be traced back, without blemish, for many years; and yet at last an individual shall be produced, having all the marks and characteristics of the cross or of the aboriginal stock.

It is probable the foregoing propositions will provoke discussion: nor shall I shrink from it. The subject of insanity is an open and expansive field; and the tillage is but just commenced: the soil is neglected, not exhausted, and will yield a rich harvest to the cultivators.

Possessing so few of the requisites, I would not presume to attempt any elaborate treatise on so obscure a disease as insanity. Yet I have the vanity—a vanity which I trust will be pardoned, when the importance of the subject is weighed—to imagine, that from the gleanings of what has been noticed by others, from what I have personally remarked myself, and from reasoning, some observations may be embodied, which may throw light on this—the most fearful and dreaded of all visitations.

However ardent the inclination, I am too sensible that there are insuperable obstacles to prosecuting inquiries into the pathology of insanity. To effect this would require to examine the bodies of many who have died insane. But if few opportunities of this nature in private practice occur, they are fully enjoyed by those who are so fortunate as to be attached to

public insane establishments: and let us hope they will not be wholly neglected. For myself, I have only to observe, that I shall consider it a great obligation, whenever such an opportunity is afforded me: and through this public channel I earnestly solicit this favour.

For the five dissections I have alluded to, I am indebted to the friendship of different medical practitioners. And I should be wanting, were I to omit this or any other occasion of expressing my gratitude for these, and the many other instances of friendly attention I have received.*

62, *Gower Street, Bedford Square.*

* Since this paper was in the press, it has been suggested to me by a most distinguished member of the profession, for whose opinion I entertain the highest respect, that, as I had proposed to occasionally offer some *Observations* on *Insanity*, it would be attended with considerable advantage were they to be published in the REPOSITORY, in a series of *Essays*. This advice I mean to adopt. Had it, fortunately, been sooner given, I might have made a different and preferable arrangement. The value and interest of the matter must greatly depend upon the assistance I receive from the profession; and on this source I very fully rely. However, for any defect of mere arrangement in the present instance, I am confident I may claim indulgence.—B.

SELECTED REVIEWS.

An Analysis of the Mineral Waters of Dunblane and Pitcaithly; with general Observations on the Analysis of Mineral, and the Composition of Bath Water and some others. By JOHN MURRAY, M. D. F. R. S. Edinburgh.

[From the Edinburgh Medical and Surgical Journal, for July 1816.]

THE essay of Dr. Murray deserves to be very generally studied by professional men; but very few of them can have an opportunity of reading it in the philosophical work in which it is published. We therefore feel a pleasure in being able to give it greater publicity; and only regret that its great length obliges us to omit some parts, and abridge others.

Dr. Murray was led to these considerations in consequence of analysing the mineral waters of Dunblane and Pitcaithly, both in Perthshire. The very ingenious method of performing these analyses, and the curious chemical views stated in regard to the methods of analysing mineral waters in general, are highly interesting to the chemical student; but we must content ourselves with extracting the results obtained from a pint,

	Dunblane. North Spring.		*Pitcaithly.* South Spring.	
Atmospheric air	-	-	0.5	
Carbonic acid gas,	-	-	1.	cubic inch.
Muriate of soda,	24	22.5	13.4	grains.
——— lime,	18	16.	19.5	
Sulphate of lime,	3.5	2.3	0.9	
Carbonate of lime,	0.5	0.3	0.5	
Oxide of iron,	0.17	0.15	trace.	
	46.17	41.25	34.3	

"It is a question not unequivocally determined, and perhaps not capable of being determined, in what state the saline ingredients of a mineral water exist,—whether the acids and bases are in those binary combinations which constitute the different neutral salts, or whether they exist in simultaneous combination, the whole acids being neutralized by the whole bases. If the former, which is the more common, and perhaps the more probable opinion, be adopted, it is at least certain, that the state of combination may be modified by the analytic operations, and that the binary combinations obtained by these may not be precisely those which existed in the water. In the case of the Dunblane water, for example, the ingredients obtained are muriate of soda, muriate of lime, and sulphate of lime. Now, it is possible that the sulphate of lime may be a product of the operation, not an original ingredient. The sulphuric acid may exist rather in the state of sulphate of soda, and when, in the progress of the evaporation, the liquor becomes concentrated, this salt may act on a portion of the muriate of lime, and, by mutual decomposition, form corresponding portions of muriate of soda, and sulphate of lime.

"A question of this kind is not merely one of speculation, but the solution of it may sometimes throw light on the properties of mineral waters, particularly on their powers of affecting the living system. The present affords a very good example of this. Sulphate of lime is a substance apparently inert. If it exist, therefore, as such in water, it can contribute nothing to its efficacy. But in the other state of combination which is supposed, both the quantity of the muriate of lime, the more active ingredient, will be greater, and the presence of sulphate of soda will in part account for the purgative operation which the water exerts.

"There is no very direct, and perhaps no decisive experiment, by which this question may be determined; for any method which would cause the *separation* of either substance as a binary compound, may also be conceived to operate by causing its *formation*."

Dr. Murray then gives some arguments in favour of his opinion.

"These results do not absolutely establish the conclusion,

that the sulphuric acid exists in this water in the state of sulphate of soda; yet, on the whole, this is the more probable opinion. If it be admitted, the preceding statement of the ingredients, and their proportions, must be altered. The sulphate of lime is of course to be omitted. The sulphate of soda, which is to be substituted for it, cannot be obtained by any method; but the quantity of it may be inferred, from the quantity of sulphate of lime which is formed by its action on the muriate of lime. Real sulphate of lime, and real sulphate of soda, are very nearly equivalent to each other with regard to the proportions of their acid and base; so that the quantity of the one may nearly be substituted for that of the other; 3.5 of sulphate lime being equal to 3.7 of sulphate of soda. But this sulphate of lime is formed at the expense of a portion of muriate of lime, and its formation is accompanied with the production of a little muriate of soda; hence the proportion of the former must be a little larger, and that of the latter a little smaller, than have been before stated. 3.5 grains of sulphate of lime are equivalent to 2.8 of muriate of lime, which quantity, therefore, is to be added to the proportion above assigned. The equivalent portion of muriate of soda to be subtracted is 3. The whole proportions, therefore, will be the following:

Muriate of soda, - -	21 grains.
Muriate of lime, - -	20.8
Sulphate of soda, - -	3.7
Carbonate of lime, - -	0.5
Oxide of iron, - - -	0.17
	46.17

"The quantity of sulphate of lime obtained in the analysis of the Pitcaithly water, being so much smaller than that in the Dunblane, it may perhaps be considered as an original ingredient; or, if even the opposite view be adopted, the change in the proportions, as indicated by the analysis, is much less. They may be stated as follow:

Muriate of soda, - -	12.7 grains.
Muriate of lime, - -	20.2
Sulphate of soda, - -	0.9
Carbonate of lime, - -	0.5

"Sulphate of lime has been often stated as an ingredient existing in mineral waters, with muriate of soda and muriate of lime. It is almost superfluous to remark, that it is probable the original ingredients, in all such cases, are sulphate of soda and muriate of lime, and that the sulphate of lime is a product of the operation; or rather, that the portion of it equivalent to the quantity of muriate of soda, has this origin.

"It is a curious fact, which strongly confirms this, that in almost all the analyses of mineral waters since the time of Bergman, when they can be presumed to have been executed with any precision, where sulphate of lime is an ingredient, muriate of soda is also present. It is obvious, that, if the sulphate of lime has this origin, muriate of soda must also be formed. On the other hand, in the greater number of those analyses in which muriate of soda is an ingredient, we find also sulphate of lime; and, with the exception of the water of Harrowgate, sulphate of lime is always present, where muriate of soda and muriate of lime are conjoined.

"But the principal interest belonging to this view, is derived from its relation to a question which has often been brought under discussion,—Whether chemical analysis is capable of discovering the sources of the medicinal virtues of mineral waters? This question some have been disposed to decide in the negative, from finding examples of waters possessed of active powers, in which analysis does not detect any ingredients of adequate activity.

"On the general question, the remark by Dr. Saunders is perfectly just, that 'considering the comparative accuracy to which chemists are at present able to carry their inquiries, we can hardly suppose, that whatever slight error might occur in the estimation of minute quantities, the actual existence of any powerful agent on the human body, in any mineral water, should escape the nicety of research.' Yet though this is just, and though we can have no hesitation in rejecting the opinion which would ascribe the medicinal qualities of mineral waters to unknown or mysterious causes, or which would deny all power to those in which an active chemical composition cannot be discovered, difficulties on this subject undoubtedly exist, and there is some room for that scepticism which has been extended to this department of the Materia Medica.

"Of this no better example can be given, than the celebrated Bath water. It has always been found difficult to account for its powers; the ingredients which are obtained in its analysis being substances of little activity, and the principal ones, indeed, being apparently inert. It contains in an English pint, along with a slight impregnation of carbonic acid, about 9 grains of sulphate of lime, 3 grains of muriate of soda, 3 grains of sulphate of soda, $\frac{8}{10}$ths of a grain of carbonate of lime, $\frac{1}{5}$th grain of silica, and $\frac{1}{70}$th grain of oxide of iron. Now, from these ingredients unquestionably no medicinal power of any importance could be expected. They are either substances altogether inert, or are in quantities so minute, as, in the dose in which the water is taken, to be incapable of producing any sensible effect. Some have from this circumstance been disposed to deny altogether any virtues to these waters; but the reverse of this appears to be established by sufficient evidence, and what is still less equivocal, the injurious effects they sometimes produce, and the precautions hence necessary in their use, sufficiently demonstrate their active powers. To account for these, therefore, various hypotheses have been proposed. The observation has been urged, which, to a certain extent, is undoubtedly just, that substances given in small doses in a state of great dilution, may, from this dilution, produce more effect on the general system than the quantity given would lead us to expect. The temperature of the water, too, it has been supposed, may have a considerable share in aiding the effect; and these two circumstances in particular, it has been imagined, may favour the action of the iron. This is the view of the subject given by Dr. Saunders, in his Treatise on Mineral Waters. Some of the other ingredients, too, it has been supposed, may exert unknown powers. Thus, some effect has been ascribed to the agency of the nitrogen gas which rises through the water. And Dr. Saunders himself, apparently not very well satisfied with the reasoning he had employed, allows some weight to the opinion suggested by Dr. Gibbes, that the silicious earth assists in the general effect of the Bath waters;—remarking, that though there is only half a grain of it in a pint of the water, this forms no objection, when the great powers of very minute quantities of active substances are considered; that neither is

its insolubility in the animal fluids an objection, as it exists in the water in a state of solution; and that, though it has neither taste nor smell, it may be an active substance, since there are indisputably powerful medicines, which have little of either of these qualities.

"All this, it is superfluous to observe, is extremely unsatisfactory. With regard to the iron, the only active substance,—allowing full weight to the observations, that small quantities of active medicines, under great dilution, operate with increased power, and that a high temperature may aid their operation on the stomach,—still we cannot believe that one-sixtieth of a grain, the quantity in a pint of this water, can produce any important medicinal effect. And, with regard to the other substances, the reasoning whence their possible operation has been inferred, instead of removing the difficulty, rather places it in a clearer light.

"The view of the constitution of mineral waters stated above, enables us to assign to the Bath water a much more active chemical composition. There is every probability that muriate of lime is its powerful ingredient. The principal products of its analysis are sulphate of lime, muriate of soda, and sulphate of soda. The proportion of sulphate of lime is such, that part of it must pre-exist in the water, but part of it, there is reason to conclude, is a product of the analysis; the muriate of soda is entirely so, and the quantity of sulphate of soda is larger than what the analysis indicates. In other words, there exist in it muriate of lime, sulphate of soda, and sulphate of lime; and, during the evaporation, the muriate of lime being acted on by a portion of the sulphate of soda, muriate of soda and a corresponding portion of sulphate of lime are formed.

"On this view of the composition of the Bath water, it is easy to assign the proportions of the ingredients, from the products which are obtained in its analysis. In the formation of 3.3 grains of muriate of soda, which is the quantity obtained from a pint of the water, 3.1 grains of muriate of lime must be decomposed: 4 grains of sulphate of soda would be required to produce this decomposition; and, at the same time, 3.8 grains of sulphate of lime would be formed.

"The latest, and no doubt the most accurate analysis of the

Bath water, that by Mr. Phillips, gives the following view of its composition:

In an English pint,	Carbonic acid, - - -	1.2 inches.
	Sulphate of lime, - -	9 grains.
	Muriate of soda, - -	3.3
	Sulphate of soda, - -	1.5
	Carbonate of lime, - -	0.8
	Silica, - - - - - - -	0.2
	Oxide of iron, - - -	$\frac{1}{6\,8}$ grain.

But, considering the composition according to the preceding view, the ingredients and their proportions will be,

Carbonic acid, - - -	1.2 inches.
Sulphate of lime, - -	5.2 grains.
Muriate of lime, - -	3.1
Sulphate of soda, - -	5.5
Carbonate of lime, - -	0.8
Silica, - - - - - -	0.2
Oxide of iron, - - -	$\frac{1}{6\,8}$ grain.

"The peculiarity in the composition of the Bath water, compared with the greater number of saline mineral waters, is, that it contains a larger quantity of sulphate of soda than is necessary to convert its muriate of lime into sulphate of lime. Hence no muriate of lime is obtained after evaporation in its analysis; hence even a portion of sulphate of soda is indicated; and hence the large proportion of sulphate of lime which that analysis yields. In the Dunblane and Pitcaithly waters, the sulphate of soda is deficient; the muriate of lime is in large quantity, and is accompanied with muriate of soda; hence the entire want of sulphate of soda, the small quantity of sulphate of lime, and the large proportion of muriate of lime in their analyses.

"Muriate of lime, it is well known, is a substance of considerable power in its operation on the living system; in quantities which are even not large, it proves fatal to animals. When taken to the extent of six grains, the quantity of it

which, according to the preceding view, exists in a quart of the Bath water, it cannot be inactive. It is very probable, too, that a given quantity of it will prove much more active in a state of great dilution in water, than in a less diluted form; as, in this diluted state, it acts, when received into the stomach, over a more extended surface; and, besides this, whatever effect may be due to the high temperature of the Bath water, in aiding the operation of the minute portion of iron it contains, the same effect must be equally obtained in aiding the operation of the much larger quantity of muriate of lime. The conclusion, indeed, as to the importance of this effect, is much more probable with regard to the muriate of lime, than to the iron; for, supposing the quantity of the former to exist in the Bath water, which has been assigned, the dose of it taken in a quart of the water is not far from its proper medium dose, and is at least equal to one-half the largest dose which can be given, and continued without producing irritation; while the dose of the iron is not the one-hundredth of that which is usually prescribed. Under the circumstances, therefore, in which the muriate of lime is presented in the Bath water, it is reasonable to infer that it must be productive of considerable immediate effect.

"The speculation is farther not improbable, that, to produce its more permanent effects on the system as a tonic, it is necessary it should enter into the circulation. In a dilute state of solution it may pass more easily through the absorbents; while, in a more concentrated state, it may be excluded, and its action confined to the bowels. Hence the reason, perhaps, that in some of the diseases in which it is employed, scrofula particularly, it has frequently failed, its exhibition having been in doses too large, and in too concentrated a form. And hence it is conceivable, that in a more dilute state, as that in which it may exist in the Bath water, besides its immediate operation, it may produce effects as a permanent tonic, more important than we should otherwise expect.

"I may add, that the iron in the Bath water is probably not in the state of oxide or carbonate, as has been supposed, but in that of muriate. The muriate is the most active preparation of iron, and so far, increased activity may be given to

the slight chalybeate impregnation; and some modification of power may even be derived from the combined operation of muriate of lime and muriate of iron.

"It deserves to be remarked, that, in the most essential ingredients, the muriate of lime and the iron, the Dunblane and Pitcaithly waters are similar to the Bath water, only with regard to the former ingredient much stronger; the other differences are unimportant; the larger quantity of sulphate of lime, and the small quantity of silica in the latter, cannot be supposed to contribute any thing to its medicinal operation; the difference in the proportion of sulphate of soda is trivial, and the larger proportion of muriate of soda in the other waters, may rather be an advantage, rendering them more agreeable to the taste and to the stomach. The principal difference will therefore be that of strength with regard to the most active ingredient, the muriate of lime. The quantity of this is so large, that the tonic quality of the Dunblane or the Pitcaithly waters can scarcely be observed, and perhaps even scarcely obtained; their action being more peculiarly on the bowels. It is accordingly as a saline purgative that the Pitcaithly water has been celebrated; and it is principally in those diseases in which this effect is sought to be obtained, that it has been used. The Dunblane water, from the similarity of its operation, would no doubt be employed in diseases of a similar kind. But whatever advantage might be derived from this purgative effect, it cannot fail to be perceived, that a different operation, not less useful, may be obtained from them. If sufficiently diluted, so as to avoid altogether the operation on the bowels, the stimulant operation on the stomach and general system might be exerted by these waters, similar to that of the Bath waters, and under this form they might prove useful in diseases very different from those in which they might otherwise be employed. As they would require, too, large dilution to reduce them to this state, the temperature of the Bath water might easily be given, by adding the requisite proportion of hot water, by which a greater similarity of operation would be obtained. And the Dunblane water in particular, containing so much larger a proportion of iron than the Bath water does, the dilution requisite to give it the same strength, with regard to the muriate of

lime, would still leave an equal degree of chalybeate impregnation. If the preceding observations, therefore, are just, the Dunblane and Pitcaithly waters may be converted, in all the essential parts of the chemical composition, into a water similar to that of Bath.

"From the preceding statement of their composition, it is easy to discover how this may be done. To give the same proportion of the principal ingredient, the muriate of lime, the Dunblane water would require to be diluted with from six to seven parts of pure water; the same degree of dilution would bring it to nearly the same strength with regard to the iron; if a pint of it were diluted with this proportion of water, about 35 grains of sulphate of soda would require to be added, to render the composition, with regard to this ingredient, perfectly alike, if this were thought essential. The only remaining differences would then be, the presence of about 2.8 grains of muriate of soda in each pint of the reduced Dunblane water, the deficiency of 5.5 grains of sulphate, and 0.7 grain of carbonate of lime, and the absence of 0.2 grain of siliceous earth, differences in all respects probably of no importance whatever. The simple expedient, indeed, of diluting one part of the Dunblane water with from six to seven parts of warm water, (or, if the sulphate of lime in a state of solution should be supposed to be possessed of any active power, with four or five parts), and adding, if the chalybeate impregnation were not found sufficiently active, a few drops of tincture of muriate of iron, would probably serve every purpose. And if sufficient confidence could be given to the substitution on the part of those employing these waters medicinally, the Dunblane water, thus altered, might probably be taken with as much advantage as the Bath water in the diseases in which it has been found useful.

"It is obvious, too, that if the artificial preparation of the Bath water were attempted, it could be done much more easily according to this view, than by endeavouring to dissolve the actual products of its analysis, which, indeed, it would be impracticable to do. Muriate of lime, and sulphate of soda, dissolved in water of the due temperature, with the addition of a minute portion of muriate of iron, would probably afford a

composition approaching as nearly to the natural composition, as is either practicable or necessary in the imitation of any mineral water."

In the latter part of this valuable paper, Dr. Murray takes a similar view of some other mineral waters.

The analysis of Cheltenham water "affords sulphate of soda, sulphate of magnesia, and sulphate of lime, with muriate of soda, muriate of magnesia, carbonate of magnesia, and oxide of iron. There is no just reason, however, to infer with certainty, that all these are its real ingredients. It is as probable, and, indeed, more so, that, previous to the evaporation by which they are obtained, it contains muriate of lime, which being acted on by the sulphate of soda, forms muriate of soda, and sulphate of lime. It is even not improbable, that the carbonate naturally existing in the water is not carbonate of magnesia, but carbonate of soda.

"The water of Harrowgate affords in its saline ingredients another illustration of the same views. The principal ingredient is muriate of soda, with which are present muriate of magnesia, muriate of lime, sulphate of magnesia, carbonate of magnesia, and carbonate of lime. Now, nothing is more probable, than that the two last substances are not original ingredients, but are products of the analysis, formed by the action of carbonate of soda existing in the water on portions of its muriate of magnesia and muriate of lime, whence also the quantity of muriate of soda is increased."

Seltzer water, "according to Bergman's analysis, contains, in an English pint,

Carbonic acid gas, - - -	17 cubic inches.
Carbonate of lime, - - -	3 grains.
Carbonate of magnesia, - -	5 ——
Carbonate of soda, - - -	4 ——
Muriate of soda, - - - -	17.5 —

"But, adopting the opposite view, the composition, so far as the uncertainty of the state of the products, to which Bergman's estimate is referred, admits of calculating the proportions, will be,

Carbonic acid gas, - -	17	cubic inches.
Muriate of lime, - - -	3.3	grains.
Muriate of magnesia, -	5	——
Muriate of soda, - -	7.8	——
Carbonate of soda, - -	10.3	—— dry, or 18 crystallized.

"This view of the composition of this water accords much better than the other, both with its sensible qualities, and its medicinal powers. Its taste, after the carbonic acid has escaped from it, on exposure to the air, is rather strongly alkaline, which would scarcely be the case, if it contained only four grains of crystallized carbonate of soda in a pint, but which is to be expected if it contain eighteen grains. It operates as an antacid and diuretic, and is productive of much benefit in all dyspeptic affections, in diseases of the urinary organs, and in those general affections of the system which require a mild tonic power. There are few mineral waters, Dr. Saunders observes, which have acquired a higher reputation; and there are few, he adds, that deserve greater consideration, from the real medicinal virtues it possesses. It will be difficult to give a satisfactory account of the origin of these virtues, if we regard it as water impregnated with carbonic acid, holding in solution so minute a portion of carbonate of soda, with the larger proportions of muriate of soda and carbonates of magnesia and lime. But if we consider it as containing along with its free carbonic acid, a considerable quantity of carbonate of soda, with smaller proportions of muriate of soda, muriate of magnesia, and muriate of lime, we assign to it a composition of much greater power, and adequate to account for the effects it produces. Such is the activity of this water, that its medium dose is only half an English pint, a degree of power which accords much better with the one view of its composition than with the other."

It is impossible to read these extracts attentively, without being struck with the truth of the views they contain, and the light they throw upon many facts in regard to the action of mineral waters, which have hitherto remained unexplained. We have always considered the change of air, temperate regimen, freedom from care, and pleasant society, to which the

advantage of residence at our various watering places has been ascribed, as inadequate to explain the effects of the waters, compared with the ingredients obtained by analysis; especially when we consider that these effects were, to a certain degree, obtained by the waters bottled, carried to a distance, and used without any of these subsidiary aids. But now, when we see that these very ingredients, which were considered as the most inert, are converted, by Dr. Murray's discernment, into the most active, the cloud which veiled our conception is removed, and every thing seems so plain and simple, that we only wonder that it ever escaped observation.

Dr. Murray's view of the composition of mineral waters does not diminish the value of those analyses which have been accurately made; but it will require them to be subjected to such a calculation, as he has exemplified in several instances, in order to have a clear view of their constituents. It has, however, occurred to us, that the best tabular form of the composition of mineral waters would be to state the quantity of each ingredient separately, as if they existed in simultaneous combination, thus:

Carbonic acid gas.
Carbonic acid.
Sulphuric acid.
Muriatic acid.
Soda.
Lime.
Magnesia, &c.

A Treatise on the Diseases of Arteries and Veins, containing the Pathology and Treatment of Aneurisms and Wounded Arteries. By JOSEPH HODGSON, Member of the Royal College of Surgeons, London. London, 1815.

Engravings intended to illustrate some of the Diseases of Arteries, accompanied with explanations. By JOSEPH HODGSON, Member of the Royal College of Surgeons, London. 1815.

[From the Edinburgh Medical and Surgical Journal, for July 1816.]

THE Royal College of Surgeons in London proposed, as the subject of the Jacksonian Prize for the year 1811, "Wounds and Diseases of Arteries and Veins." There was much propriety in the selection of this most interesting subject; for there is not, perhaps, any other in which the superiority of modern surgery stands more highly displayed; and certainly there is no one in which the skill, enterprise, and science of British surgeons have been more successfully exerted than this. Indeed, we hardly know any thing more brilliant in the history of surgery, than the improvements which have been made, in our own days, by British surgeons, on the operations and treatment of aneurisms, and of wounded arteries. So lately as when we first began our studies, surgeons still hesitated to tie up the main trunk of an artery in the extremities,—and when the necessary attempt proved successful, instead of reckoning their success a thing of course, and referable to the wise and almost unerring provision which nature had made for continuing the circulation in the limb, by the collateral and anastomosing vessels, they conjectured only the existence of a lusus, or higher division of the arterial trunk.

Of the causes of secondary hæmorrhage, of the process of nature in the cure of opened arteries, and of the effect of the ligature which they daily used, their conceptions were still crude and imperfect. We have, not long since, known tapes nearly an inch broad applied to the artery in aneurism, in the fear that such ligatures as the surgeon trusted to in his ordinary operations, should cut and ulcerate the vessel; not to speak of the *serre arteres*, and other ingenious pieces of me-

chanism for keeping the sides of an artery in compressed and flattened apposition, with which the French and Italian surgeons are still amusing themselves.

The British surgeon now knows so well the powers and resources of nature, that there is not an arterial trunk within his reach that he has hesitated to tie; and he has thus successfully thrown a slight and single ligature round the femoral, the carotid, the external, and even the internal iliac artery. He knows now, that a large, broad, and flattened ligature is the worst, precisely for that reason, on account of which it had been thought the best and most secure; and that one of the reasons, for which he now employs a small thread, is to cut and wound the artery he was formerly so anxious to save. He has ascertained, that, by this division of the internal coats of the artery, it becomes permanently closed and cicatrized by adhesive inflammation; that every thing which interferes with this process, and which, instead of it, has a tendency to produce the suppurative or ulcerative inflammation, becomes a cause of secondary hæmorrhage; and, therefore, that the vessel must be separated as little as possible from its attachments; that no foreign body must be interposed for greater security; that the ligature itself should be small, that it may, as a foreign body, offend the least possible; he cuts off one end of it to lessen its bulk still farther; he has even risked cutting away both ends close to the knot, and closing the external wound over it; and he has talked of removing the entire ligature almost as soon as he has tied it, believing that its principal use has been effected when it has divided the coats of the artery, and produced in them a disposition to adhesion. Lastly, instead of slitting open the aneurismal tumour, as was the general practice little more than twenty years ago, he simply secures the artery at some distance above the tumour, and the direct impulse of the circulation being thus interrupted, he trusts to the establishment of a new and devious circulation, and to the consequent condensation and absorption of the aneurismal contents. To all these improvements, British surgery has almost an exclusive claim; and the Jacksonian prize was adjudged by the Royal College to Mr. Hodgson for an Essay, which has laid the foundation of the very excellent treatise now before us. In separate parts, the

author treats in succession, 1*st*, of the dieases of arteries in general; 2*d*, of aneurism; 3*d*, of wounded arteries; and 4*th*, of the diseases of veins. Besides being the subject of inflammation, ulceration, and sphacelation, like other structures, the arteries are liable to other and peculiar morbid changes, to cartilaginous and steatomatous thickenings of their internal coat, and to a deposition of atheromatous and calcareous matter. And these changes are very commonly the forerunners of the more formidable disease of aneurism. But, before entering on the subject of aneurism proper, Mr. Hodgson directs our attention to the cases of preternatural dilatation of the arteries. This disease is different from aneurism, as all the coats of the vessels are uniformly dilated, without any breach of their continuity. Its most frequent seat is the ascending portion and arch of the aorta, though it has been observed in the thoracic and abdominal aorta, and at the divisions of the carotid and iliac arteries. The pouch or sac which is thus formed, is commonly thickened, and covered with atheromatous and calcareous depositions; but this dilatation seldom if ever is found to contain those lamellated coagula which are so generally discovered in the true aneurismal sac; which last, on the contrary, is not often found interspersed with calcareous or ossific deposits like those pouches or dilatations, in which all the coats of the artery are entire. A true aneurism may be, and sometimes is, found engrafted upon a sac of simple dilatation.

Our readers are aware, that the observations of Scarpa have led to the conclusion, that, in aneurism, the formation of the tumour is preceded by a rupture or breach of the internal and middle coats of the artery, and that the sac is formed by the consequent dilatation of the outer coat, and cellular sheath of the vessel.

After having ascertained the fact, therefore, that the whole circle of an artery is found to be preternaturally dilated, in a great many cases, without laceration or destruction of any of its coats, it seems to us a mere affair of arbitrary definition, whether such cases shall be called aneurism or not; and especially, it seems to us, that Mr. Hodgson, after describing this case of preternatural dilatation as a distinct disease, and beginning his section on aneurism with a *definition*, limiting its

interpretation to the case in which the internal and middle coats have given way, would have saved to himself, and to his readers, some little confusion, by maintaining this distinction throughout. Instead of which, he resumes the consideration of dilatation with integrity of the coats of the artery, and reasons upon the subject in a way which leaves us, in some degree, at a loss to know whether he would class it with aneurism or not. Thus, he begins with stating the question, "Does aneurism ever consist in a general or partial dilatation of all the coats of an artery, or is it constantly produced by the destruction of all, or most of the coats?"

That disease, indeed, already described by him in a separate section, and said to consist in a preternatural dilatation of the whole circle of an artery, and not in a partial or lateral distension of its coats, Mr. Hodgson continues to disunite from aneurism. But the case of a partial dilatation of the coats without rupture, he seems inclined to consider as less separable from ordinary aneurism; and he maintains, that, in a great proportion of aneurisms, the disease has commenced in a partial dilatation of the coats of the artery, although, in the progress of the disease, the internal coats do at length give way. In the generality of cases, indeed, he allows with Scarpa, that the formation of the aneurismal tumour is preceded by rupture of the internal and middle coats of the artery. But very many, he contends, have their origin in previous, general, or partial dilatation of all the coats.

"Those aneurisms which are situated at the origin of the aorta, are generally formed by dilatation of the coats of the vessel. The internal surface of the sac, in most instances, exhibits some of those morbid alterations which are peculiar to the internal coat of an artery. The mouth of these sacs is generally larger than any other part of the cavity, and there is not that circumscribed margin between the artery and the sac, which is constantly met with where aneurism is formed by destruction of the coats of the vessel."

Mr. Hodgson has seen this partial dilatation, in almost all the arteries which are subject to aneurism. Such dilatations frequently precede the formation of aneurism in the arteries of the extremities. The cases and observations brought forward

by Mr. Hodgson, as well as the disputes which have always existed amongst anatomists on this subject, leave no doubt as to the existence of these pouches, and dilatations of the coats of an artery without any rupture; and all that our author seems to contend for is, that many aneurisms have their origin in such general and partial dilatation.

"1*st*, Numerous aneurisms are formed by destruction of the internal and middle coats of an artery, and the expansion of the external coat into a small cyst, which giving way from distension, the surrounding parts, whatever may be their structure, form the remainder of the sac. 2*dly*, Sometimes the disease commences in the dilatation of a portion of the circumference of an artery. This dilatation increases until the coats of the vessel give way, when the surrounding parts form the sac, in the same manner as when the disease is in the first instance produced by destruction of the coats of an artery."

The original question, however, proposed by Mr. Hodgson, "Does aneurism *ever consist in a general or partial dilatation of all the coats of an artery;* or, is it constantly produced by the destruction of all or most of these coats?" seems thus rather to be gotten rid of, than answered.

It seems, however, to be our author's conclusion, that, although aneurism has often its origin in such dilatation, the case of dilatation ought not to be considered as one of aneurism, till the internal and middle coats of the artery have given way. There is one thing peculiar to this restricted case of aneurism which deserves notice, the deposition of the fibrous portion of the blood in concentrical laminæ upon the internal surface of the sac. "It is almost universally found in aneurisms in which the coats of the artery have given way, but in those sacs which consist in a general and partial dilatation of the coats of the vessel, I have never met with it."

Aneurism, and those diseases of the coats of the arteries which precede its formation, occur much more frequently in men than in women. And the following table exhibits the comparative frequency of aneurisms in the two sexes, in different cases of the disease, in which our author has had an opportunity of seeing his patients during life, or of examining the parts soon after death.

	Total.	Males.	Females.
Of the ascending aorta, the arteria innominata, and the arch of the aorta,	21	16	5
Descending aorta,	8	7	1
Carotid artery,	2	2	
Subclavian and axillary arteries,	5	5	
Inguinal artery,	12	12	
Femoral and popliteal arteries,	15	14	1
	63	56	7

Having considered most of the questions connected with the nature and formation of aneurisms, and having pointed out the symptoms and diagnosis of the disease, Mr. Hodgson gives us some very important and highly interesting observations on the spontaneous cure and medical treatment of aneurism; a subject which, he observes, might, from the bold and successful operations now performed with so much precision, appear superfluous. But the processes of nature are the lights of surgery, and the guides of the operator; and when the disease is beyond the reach of surgery, as in aneurism within the cavities of the thorax and abdomen, the attempts of nature sometimes prevent a fatal termination, and when her processes are understood, they may be assisted by medical treatment.

The processes by which the spontaneous cure of aneurism is effected, are thus stated by Mr. Hodgson.

First, The removal of the whole tumour by sphacelation, in consequence of the extreme inflammation excited by the distension of the surrounding parts.

Secondly, The tumour assuming such a position, as to obliterate by its pressure the superior or inferior position of the artery communicating with the sac.

Thirdly, The gradual deposition of the fibrine of the blood in the aneurismal sac and the artery leading to it, so as to render them impervious, and allow a subsequent process, by which the tumour is removed.

Mr. Hodgson illustrates all those modes of spontaneous cure by cases and observations, and deduces from them the circumstances under which they may respectively take place. The last mode is by far the most frequent and the safest, and

that which art is most capable of assisting. Indeed, in all our operations of aneurism, Mr. Hodgson shows, that it is by this mode the cure is ultimately effected, though the unassisted efforts of nature are sometimes sufficient for the purpose. Numerous instances, he observes, are recorded, in which this process is noticed as having taken place; but its importance in the cure of aneurism, and the circumstances which influence its accomplishment, do not appear to have received that attention which, in a practical point of view, they deserve.

The process consists of the three following stages, according to the result of Mr. Hodgson's inquiry: *First*, The cavity of the sac is gradually filled with layers of coagulum. *Secondly*, The circulation through the vessel is in most instances prevented by the extension of this coagulum to the origin of the next important ramifications that are given off by the artery, from which the disease originates.

Thirdly, The coagulum is gradually absorbed, and the artery and the sac contract, until the one becomes an impervious cylinder, and the other a small fleshy tumour.

Thus, where the circulation can be carried on by the collateral branches, a perfect cure of the aneurism is effected, and life is preserved. But, in internal aneurisms, in aneurisms of the aorta, particularly of the arch or ascending portion of that vessel, the completion of this process in all its steps would not be so fortunate. But here nature proceeds no farther than she can be useful; and Mr. Hodgson, by a selection of cases and observations, has shown, that a deposition of coagulum may take place in an aneurismal sac to such an extent, as entirely to preclude the communication between its cavity and that of the artery from which it originates; that a sac thus filled with coagulum, cannot prove fatal by rupture; and that the gradual absorption of its contents, and the consequent contraction of the sac, may proceed to such an extent as to effect a cure of the disease, without any obstruction taking place in the calibre of the vessel from whence it originated.

A true aneurism commonly communicates with the canal of the artery by a small and lateral opening, the aneurismal sac soon begins to exhibit the formation of those deposits of concentric layers of coagulable lymph;—and, by the successive

depositions of those layers the sac is strengthened, and, in some cases, filled up and rendered solid; and then the process of condensation and absorption takes place, and an aneurismal tumour, which had risen out of the thorax, beaten furiously, and threatened destruction, gradually retires, and at length disappears. It is consoling to know, that even under such an alarming and generally fatal state of things, there is this chance of escape. The cases reported by Morgagni of the cures performed by Valsalva and Albertini;—those related more lately by Pelletan, and other continental surgeons and physicians, afford examples of this fortunate interruption to the fatal termination of aortic aneurism. Several cases, in illustration of the completion of this fortunate process in different orders of arteries, are related by Mr. Hodgson. We select the two following, as having occurred in the aorta itself:—

"A miller, about fifty years of age, had, for five years before his death, been afflicted with severe symptoms of asthma. Various medical men considered him as labouring under that peculiar asthma to which those who follow his occupation are subject. His symptoms, however, were always relieved by copious bleedings. The above was all the information which could be procured relative to his disease, when the body was examined. The lungs were perfectly healthy. A small aneurismal sac originated from the posterior part of the arch of the aorta, close to the root of the arteria innominata. This sac was about the size of a common walnut, and the coats of the aorta were deficient at its base for the space of about the size of a sixpenny piece. The cavity was completely filled with very firm layers of coagulum, resembling more the appearance of boiled muscle than any other substance with which I am acquainted. The opening by which the sac had communicated with the aorta was blocked up by the base of the coagulum, but the cavity of that vessel was not in the least diminished. The tumour adhered posteriorly to the trachea, which was thrust out of its natural position, and had assumed a very remarkable curve, by which its calibre was reduced to one half of the natural dimensions. The coats of the aorta were thickened, and covered with steatomatous and earthy depositions.

"Some years ago, I had an opportunity of examining the

body of a young woman who died with an aneurism of the arch of the aorta. The tumour appeared above the sternum, rather on the right side. It was large and pulsating, and her death was hourly expected to take place, from the rupture of the integuments, which were very thin and livid. From the employment of repeated bleedings, rigid abstinence, and quietude, the pulsation in the sac became gradually less violent; its size diminished; it became more solid; and, in short, in a few months she was so far recovered as to be able to resume her former employment. In twelve months she returned, complaining of a constant irritating cough, attended with a copious expectoration of frothy mucus, which in the course of a few weeks, destroyed her; the tumour at that time being scarcely to be felt above the sternum. Upon dissection, an aneurism was discovered, of the size of a small apple, originating from the anterior part of the arch of the aorta, the pressure of which upon the trachea had produced the fatal cough. This tumour was very solid, and when divided was found to be composed of firm but distinct layers of coagulum, of a whiter and more fleshy appearance than it is met with in recent cases.

"The cavity of the sac had formerly communicated with that of the aorta, by an opening about the size of half a crown, now closed by the base of the coagulum, the surface of which had a smooth and membranous appearance. But the coagulum did not in the least extend into the cavity of the aorta, the calibre of which was consequently not obstructed by the process of cure, which had taken place in the aneurism. The coats of the aorta were thickened, and considerably dilated, particularly at the origin of the arteria innominata, and at the root of the aneurism, which appeared to be formed by the destruction of the dilated coats of the vessel."

As this, then, is the only means by which life can be prolonged in cases of internal or aortic aneurism, the important question arises, how far this natural process can be assisted by medical treatment? And the success which has, at various times, attended that antiphlogistic and depletory treatment which has been called the method of Valsalva, and which consists mainly of repeated blood-letting, holds out to us no in-

considerable conquest. This method has evidently been at first undertaken with the more obvious view of keeping the vessels empty, and lessening the impetus of the circulation upon the aneurismal tumour, and thus postponing at least the fatal rupture of the sac. But in many cases of the result of this treatment upon record, this more obvious indication has not only been answered, but the aneurismal tumour has been observed to subside; to acquire firmness and resistance; to cease to pulsate; and, at length, to retire within the cavity from which it had protruded. We cannot therefore doubt, that, by enfeebling the action of the heart and arteries, and lessening the impetus upon the tumour, we facilitate the deposition of lymph within the sac, thus strengthen its parietes, and eventually promote that process by which the aneurism admits of consolidation and cure. The following case came under our author's observation:

"A soldier, twenty-five years of age, had an aneurism, which pointed on the left side of the chest, near the sternum, in the situation of the fourth and fifth ribs, the cartilages of which were absorbed, and the external tumour was as large as a lemon. The pulsation was extremely violent, and the impediments to respiration were very considerable. Previous to the time when he came into the hospital, he led a dissipated life, and the increase of the tumour had been very rapid. He was repeatedly bled, was placed upon a low diet, and took occasional purges. This plan soon reduced him exceedingly; but, from that time, the tumour ceased to increase, and a livid inflammation which had taken place upon its apex subsided. In a month, the tumour had diminished, and the respiration was much less affected. In three months, no external tumour was perceptible: his breathing, indeed, was difficult, but the inconvenience from this cause was trifling compared with what he had previously endured. Unless he was agitated by passion, or the circulation was accelerated by the use of stimulants, he suffered but little from the disease. In six months, he left us and returned to his trade as a labourer, at which time his breathing was but little impeded. The deficiency of the cartilages of the ribs was very perceptible, but there was no external tumour."

"Pelletan," he observes, "has detailed fourteen cases of aneurism, all of which were materially benefited by this treatment; and in two of them permanent cures appear to have taken place. One man was sixty one years of age, in whom the aneurism appeared on the right side of the chest. "During the first eight days," says Pelletan, "I prescribed eight bleedings, consisting of four porringer-fulls (*pallettes*) in the morning, and two in the evening. On the fifth day, the pain and the pulsation were considerably diminished, but the pulse at the wrist still preserved its fulness. Two porringer-fulls of blood were taken from him; the pulse continued weak until the seventh day, when it again rose. Another porringer-full of blood was taken from him in the morning, and a second in the evening. During this time, the patient was placed upon a rigorous diet. A cold cataplasm, composed of linseed meal and vinegar, was applied to the tumour, and renewed as soon as it became warm. This treatment produced a wonderful effect in eight days; the pain and pulsation disappeared; the debility of the patient did not otherwise injure the state of his health. He observed perfect tranquillity, and did not complain of any uneasiness when the pain and pulsation had entirely vanished. We gratified his extreme desire to be allowed an increase of diet, but this was done by degrees."

"When this treatment had been employed twenty-eight days, the man left Paris. After some months he returned to his business as a porter, grew fatter than before, and continued without any vestige of the disease, except a slight and deep pulsation at the part where the pulsation of the arch of the aorta may be felt in the natural state. Pelletan saw this man daily for two years after the cure was accomplished, when he died of another disease.

"In a very large axillary aneurism, a cure was effected by similar treatment. The size of the tumour, and the effects which it had produced upon the surrounding parts, placed it beyond the reach of operative surgery. A most abstemious diet, consisting only of two basins of broth in the day, and a common drink of lemonade, was prescribed, and twelve porringer-fulls of blood were taken from the arms at six bleedings, in the course of the first five days after his admission into the hospi-

tal. On the second day after the commencement of this treatment, the tumour was less tense and painful. On the third day it was considerably diminished in size, and evidently consisted of two portions, which were separated from each other by the pectoral muscle. On the ninth day it was one-third less in size than at the commencement of the treatment: the pulsation had ceased, but the patient was reduced to an alarming state of debility. He continued in this state two days, and recovered from it by the use of a more generous diet and a little wine. The pulse returned in the opposite wrist, but not in the aneurism;—the tumour became softer. Powdered ice, inclosed in bags, was applied for twenty days, when a solution of salt was substituted for it. The swelling gradually contracted, and in forty-six days the surrounding parts were easily distinguishable. The limb had recovered its strength and motion; there was no pulsation in the tumour, nor at the wrist of the affected arm; and his general health was completely restored. Some months afterwards there only remained a small knot in the axilla."

Besides the employment of blood-letting, other evacuations, an antiphlogistic regimen, low diet, and digitalis, are also recommended. These have, in some instances, appeared to be useful. Mr. Guerin strongly recommends as an adjuvant, cold applications, and powdered ice to the tumour itself. In a case of inguinal aneurism, in which our author witnessed its employment, it produced such intolerable pain as called for its discontinuance. From the whole of the observations collected by Mr. Hodgson, he thinks himself warranted in the following deductions:

"1*st*, The deposition of coagulum in the cavity of the aneurismal sac, and the artery leading into it, is the mode by which the spontaneous cure of aneurism is, in most instances, effected.

"2*dly*, the coagulum is subsequently absorbed; and the sac and artery contract, until the one becomes an impervious cylinder, and the other a small fleshy tumour.

"3*dly*, In some instances, the cure is effected by the obliteration of the cavity of the sac, without any obstruction taking place in the calibre of the artery, from which the disease origi-

nates. In this manner a cure may take place in aneurisms of the aorta.

"4*thly*, The formation of coagulum being a general occurrence in aneurisms, it is an important object to prevent the increase of the sac, that the deposition of coagulum may proceed to such an extent as to obliterate its cavity.

"*Lastly*, It is the force of the circulation which causes the enlargement of the sac and its ultimate rupture: Hence the diminution of the force of the circulation is the principal indication in promoting the spontaneous cure of aneurisms."

In the next section, Mr. Hodgson proceeds to the consideration of the surgical treatment of aneurism. But as this part of the subject is much more familiar to the English reader than the medical treatment of aneurism, we shall be more brief in our account of it. Every thing, however, connected with this still interesting, and not yet exhausted subject, is not only very fully investigated by our author, but by his judicious observations, and criticism on disputed or more doubtful points, he has, we think, extended the limits of this branch of surgical science.

In the treatment of aneurism, the object of surgery is, to obliterate the calibre of the artery communicating with the sac, so as either at once to prevent the blood flowing into it, or at least to diminish the volume and force of its current, so far as to prevent the increase of the tumour, and to promote the coagulation and absorption of its contents,—while the blood passes on through new channels by means of the collateral branches. The obliteration of the main artery is attempted by compression or by ligature. There is no reason to doubt that cures have been promoted by different modes of compression. General compression of the limb, with a system of abstinence and depletion, may have assisted the spontaneous cure of aneurism. The attempt to compress more completely and entirely the artery feeding the aneurismal tumour, is now superseded by the improved mode of operating introduced by Mr. Hunter, and, since his time, brought to a very high degree of perfection by our own surgeons. There are three points connected with the operation of aneurism which claim particular attention. 1*st*, The application of the ligature. 2*dly*, The mode by

which the blood is conveyed through collateral channels to the parts which it is destined to supply. And, 3*dly*, The changes which take place in the tumour, in consequence of the ligature of the artery, at a distance from the disease. All these subjects are discussed in a very able and luminous manner by Mr. Hodgson. The experiments of Dr. Jones, confirmed and extended by succeeding observations, have thrown a new light on the action of the ligature, and have led to some important improvements in its application.

"Instead of simply producing an approximation of the opposite sides of the vessel, it has been ascertained by an extensive series of experiments, that the application of a ligature to an artery is the performance of a distinct operation upon it, producing a wound in its internal and middle coats, which gives rise to an effusion of lymph, whereby the opposite surfaces of the extremity of the vessel are united, in the same manner as soft parts in general are healed by the adhesive inflammation. The immediate effect of the ligature is the obstruction which it affords to the passage of the blood through the vessel; but its more important results are, the adhesion and obliteration of the extremity of the tube. The processes by which these objects are accomplished are the following: The internal and middle coats are cut through by the ligature, and are thus placed in the condition of simple incised wounds. From these cut edges an effusion of lymph takes place, which seals the extremity of the tube, forming a matrix for vessels, which extend from the wounded surfaces, and unite the opposite sides of the canal in that situation. At the same time the inflammation, excited in the coats of the artery, produces an effusion of lymph between them, with which they are thickened; and, from the surrounding parts, a similar effusion takes place, which covers the vessel externally, and affords it additional support. The ligature causes the death of that portion of the external coat with which it is in immediate contact. In a little time this slough is detached by ulceration, and the ligature is cast off. But the recent adhesion at the extremity of the vessel would probably be too weak a barrier to the impulse of the circulation, especially in the larger arteries, if the portion of the vessel between the ligature and the next collateral branch

were not, in most instances, filled with the coagulum of the blood, which, in this situation, meets with an obstacle to its progress, and is placed, as it were, out of the course of the circulation. The coagulum deposited from the blood, under these circumstances, forms a plug, which removes the impulse of the circulation from the recently cicatrized surfaces. This plug, however, serves but for temporary purposes. It is gradually absorbed; and that portion of the vessel which is situated between the ligature and the next collateral branch, contracts, and ultimately degenerates into a simple ligamentous cord.

"Such are the processes which Dr. Jones ascertained to follow the application of a ligature to an artery, differing from his account of them only in this point, that the ligature is here stated to cause the sloughing, and not the ulceration of that portion of the external coat which it immediately embraces. This circumstance I have inferred from the examination of several arteries which have been tied in the human subject as well as in brutes; and from having observed that, after several operations for aneurism, in which the vessel was not divided, the ligature brought with it, in its ring, a considerable portion of slough of a cellular structure, accurately resembling the external coat of an artery."

One of the most distressing occurrences, after the operation of aneurism, has been that of secondary hæmorrhage. The causes of this, however, are now better understood; and, in so far as these can be avoided, or their effects prevented, the surgery of aneurism is now in a very improved state. The principal causes of secondary hæmorrhage are the obstacles which the adhesive inflammation has met with, in consequence of, 1*st*, a morbid condition of the coat of the artery; 2*dly*, the application of an improper ligature; 3*dly*, its premature removal; and 4*thly*, sloughing or ulceration of the vessel and surrounding parts.

Having examined at length the operation of these causes, and explained the mode in which they are most likely to be obviated, Mr. Hodgson sums up the whole in these conclusions:

"1*st*, The cord should be thin and round, such a ligature

being most likely to effect a clean division of the internal and middle coats of the vessel, and not liable to occasion extensive ulceration or sloughing.

"2*dly*, The ligature should be tied very tight, in order to insure the complete division of the internal and middle coats, and to prevent its detachment, it being almost impossible, even with the thinnest ligature, entirely to cut through a healthy artery.

"3*dly*, The vessel should be detached from its connexions, only to such an extent as is necessary for the passage of the ligature underneath it.

"4*thly*, The immediate adhesion of the wound should be promoted by all those means which assist that process in general.

"*Lastly*, Experience having proved that secondary hæmorrhage more frequently arises from an improper mode of tying the artery, or of treating the wound, than from the condition of an undivided artery, the practice of applying two ligatures, and dividing the vessel in the interspace, is not an essential object. But in situations where there is a vigorous circulation at both ends of the vessel, the application of two ligatures is advisable."

When the main artery, supplying the aneurismal tumour, has been tied, the blood passes through the collateral and anastomosing branches to the lower part of the limb; and so extensive is this provision for carrying on the circulation, independently of the principal arterial trunks, that, with the exception perhaps of the ascending aorta and its arch, there is not an artery in the body which may not be tied with the utmost confidence, that the parts beyond the ligature will continue to be supplied with blood by anastomosis. The descending aorta itself forms no exception to this rule. It has been tied in brutes, and it has been found obstructed in man. There are, indeed, circumstances in the condition of the part operated on, or in the general health of the system, which may prevent the full establishment of collateral circulation. In particular, extensive disease of the arteries themselves may have this effect; or previous wounds, or the bulk of the aneurismal tumour, destroying or pressing upon the principal anastomoses, may also

interrupt it. A languid state of the circulation, such as exists in old and infirm habits, is also adverse to the enlargement of the anastomosing branches. When the collateral circulation fails from any of these causes, the limb sphacelates and dies. But, generally,

"*First*, When the circumstances tending to prevent the establishment of a collateral circulation do not exist, we need not apprehend the death of any part in consequence of a deficient supply of blood after the ligature of its main artery.

"*Secondly*, The circulation will be as effectually carried on in a healthy limb, when the main artery is suddenly tied in consequence of a wound, as when an aneurism has existed for a considerable time.

"*Lastly*, The practice of permitting an aneurism to increase, that the collateral branches may become enlarged, is not only unnecessary, but injurious, inasmuch as that the increase of the tumour must be attended with a destruction of the surrounding parts, which will render the cure of the disease more tedious and uncertain."

The effects produced on the aneurismal tumour by the ligature of the arterial trunk, from which it originates, are the interruption to the passage of the blood immediately through it; the consequent cessation of pulsation; the coagulation of its contents; their gradual absorption; and the complete obliteration of the cavity of the sac.

"But when the artery is tied at a distance from the disease, the ingress of the blood is not altogether prevented, for the anastomosing branches which open into the trunk below the seat of the ligature, convey a stream which passes through the aneurism. The impulse of this current is, however, so trifling, that the enlargement of the sac not only ceases, but the deposition of coagulum in it increases, in consequence of the languid state of the circulation. The coagulum accumulates until the cavity of the sac and the mouth of the artery, leading into it, are obliterated. By the absorption of the coagulum, and the contraction of the sac, the cure is ultimately accomplished, in the same manner as when the artery is tied close to the tumour, or the disease is remedied by the spontaneous efforts of nature.

"That a stream of blood, in most instances, passes through the sac after the ligature of the superior part of the artery, at a distance from the disease, is confirmed by numerous observations, and is a fact of great importance, both in a practical and pathological point of view. It is proved, 1*st*, By the occasional recurrence of pulsation in the tumour after the operation; 2*dly*, By cases in which the cavity of the sac has been exposed, and hæmorrhage has been the consequence; and, 3*dly*, By dissections, in which it has been found that the cavity of the aneurism, as well as that of the artery from which it originated, was pervious from the part which was obliterated by the direct operation of the ligature."

The artery itself, after it has been tied, gradually contracts, loses its calibre, and, some time after, is found to be consolidated, and converted into a ligamentous cord, to some extent, both above and below where the ligature had been applied, generally to the sending off of some principal collateral branch by which the circulation is continued through the limb.

"In the preparations," observes our author, "that I have examined, and in all the cases that I have met with upon record, in which the parts were dissected, after a complete and radical cure of aneurism was effected in consequence of the modern operation, the cavity of the sac has been obliterated, and the only vestige of the disease which remained was a solid ligamentous substance. Both extremities of the artery from which the aneurism arose were also obliterated to the origin of some important branch. In Mr. Astley Cooper's case, the femoral artery was converted into a solid cord, from the origin of the profunda to the commencement of the tibial arteries. This, however, is the only instance with which I am acquainted where so extensive an obliteration of the artery had taken place. In all the other dissections after the modern operation for popliteal aneurism, that I know of, the femoral artery has been found to be obliterated for the space of three or four fingers' breadth at the place where the ligature was applied; below that part it was pervious, and continued so for some distance, when the obliteration again commenced, and continued throughout a considerable extent of the popliteal to the origin of the inferior articular or tibial arteries. Thus,

as it were, an insulated portion of the femoral artery preserved its cavity, which was terminated above by the part which had been obliterated by the ligature, and below by the part which had become impervious, in consequence of the effects of the operation upon the aneurism in the ham. From each extremity of this insulated portion of artery which still preserved its calibre, considerable anastomosing branches arose, the upper branches conveyed blood into the vessel, and the lower transmitted it into anastomosing channels that originated below the knee. A double collateral circulation, therefore, existed in the limb, namely, one by which blood was conveyed from the branches of the profunda into the femoral artery, which was pervious below the part obliterated by the ligature; and a second, by which it was forwarded from this insulated portion of the vessel into the trunks of the leg through the articular arteries of the knee."

The existence of an aneurism in a situation where it is impossible to tie the artery above the tumour, has suggested the experiment of securing, in such a case, the artery below the tumour, in the expectation that an impediment would be given to the free passage of the blood through the aneurismal tumour, sufficient to occasion a stagnation and coagulation of its contents. This practice, originally proposed by Dessault, was tried by Deschamps in a case of inguinal aneurism. The experiment was unsuccessful; and Mr. Hodgson conjectures that a branch had opened between the ligature and the tumour, by which it continued to be supplied. This operation has also been performed in London.

"Mr. A. Cooper was consulted in a case of aneurism of the external iliac artery, which extended into the abdomen as high as the internal iliac, so as to render it impracticable to tie the artery above the tumour. The disease had thrust forwards the inferior portion of the abdominal muscles and Poupart's ligament. The rapidity of its progress threatened the life of the patient. The femoral artery was tied between the origins of the epigastric artery and of the profunda. The pulsation continued; but the tumour did not increase in size after the operation. The ligatures separated favourably. The aneurism diminished so considerably, that it was conceived, in a little

time, if its diminution continued, it would be possible to tie the external iliac artery above the tumour. The patient went into the country to recruit his general health, where the aneurism burst underneath the peritoneum, and he died in consequence of the extravasation of blood into the cellular membrane of the pelvis and scrotum. In this instance the femoral artery was tied below the origin of the epigastric and circumflexa ilii arteries; a current, therefore, continued to pass through the sac into these vessels; consequently the blood was not at rest in the aneurism, and did not coagulate. After the ligature of the artery, the blood was transmitted more readily through the internal iliac than through the arteries which originated below the aneurism, namely, the epigastric and circumflexa ilii. The contraction of the sac, therefore, appears to have been the consequence of the diminution of the stream which passed through it, in the same manner as an aneurism contracts, although a current enters it after the ligature of the artery, at a distance from the disease. It is to be regretted that, in the instance which I have now related, an opportunity could not be obtained of examining the actual condition of the parts after death."

Notwithstanding the failure of these cases, Mr. Hodgson concludes, that the effect of tying an artery below the aneurism has not yet been determined by experience. "There is strong reason," he observes, "to believe that if no branch originated from the aneurism, or from the artery below the aneurism, the blood would coagulate in the tumour, and that a cure would be accomplished by the absorption of this coagulum, and the subsequent contraction of the sac." The principle upon which a cure is expected to follow this mode of operating, is the same as that upon which varicose veins are cured by tying the superior part of the vessel. The obstructed blood coagulates in the dilated vein,—the coagulum is absorbed,—the cyst contracts, and the disease is cured.

Having at great length, and with much acuteness and intelligence, investigated the pathology of aneurisms in general, Mr. Hodgson closes this part of his subject by invoking the reader's attention to the identity of the processes, by which a spontaneous cure of aneurism is occasionally accomplished,

and the effects produced upon the disease by the modern operation.

"If the patient be feeble, and the circulation languid, the cavity of the sac is gradually filled with strata of coagulum deposited from the blood which passes through it; by the absorption of this coagulum, and the contraction of the sac, a cure is ultimately accomplished. If a languid state of the circulation be induced by abstinence and depletion, these processes of spontaneous cure are promoted.

"If the artery be tied above an aneurism, the ingress of blood into the tumour is not entirely prevented; but the stream which passes into it from collateral branches, is not sufficient, either in quantity or in force, to continue the disease. Under these circumstances, the deposition of coagulum is promoted by the languid state of the circulation through the tumour. The cavity of the sac is gradually filled, and the same processes of absorption and contraction ensue, as when the disease undergoes a spontaneous cure.

"The cure of aneurism in general, whether effected spontaneously, or by the assistance of art, is therefore referable to one principle,—the diminution of the force of the circulation through the sac:—All which art can with safety accomplish, is to place the parts in a condition in which the powers of the economy are capable of remedying the effects of disease."

Our author now proceeds to investigate the history of particular aneurisms;—and, in distinct sections, he gives a very minute and detailed account of every thing connected with the formation, progress, termination, and treatment of each variety. But here it is not our intention to go into details. It is sufficient to remark, that, under the heads of carotid aneurism, —axillary and subclavian aneurisms,—brachial, radial and ulnar aneurisms,—inguinal aneurism,—gluteal and ischiadic,—femoral, popliteal, and tibial aneurisms, the reader will be gratified with a variety of interesting cases and observations, and by an account of those brilliant operations which reflect so much honour on modern surgery. The subject of wounded arteries, including the processes of nature and of art for the suppression of hæmorrhage, is also discussed with much ability by Mr. Hodgson. His observations on the diseases of veins

are no less worthy of notice, and we regret that our limits, already transgressed, do not permit us to introduce our readers to at least a superficial acquaintance with them. The diseases of the veins are respectively considered under the heads of inflammation of the veins,—morbid changes of their coats,—and varicose veins. There is also a section on the obliteration of veins, and venous collateral circulation, highly deserving a careful perusal. To conclude; we can, with great confidence, recommend this volume to the attention of our readers, as embodying a great variety of fact and illustration, and presenting a very faithful and interesting record of the improved state of science and of art in pathology and surgery.

Researches on Pulmonary Phthisis from the French of G. L. Bayle, D. M. P. By William Barrow, M. D. Senior Physician to the Fever Hospital, Lunatic Asylum, and Workhouse, Liverpool. Liverpool, 1815.

[From the Edinburgh Medical and Surgical Journal, for July 1816.]

This is a very good book, although the extravagant praise with which it is introduced to our notice by the translator, almost prepossessed us against it. But a translator must be looked upon as a lover, who has eyes only for his mistress, and thinks "this present age yields not a woman worthy to be her second." We readily admit, that "the indefatigable industry and perseverance of M. Bayle, his unassuming modesty and candour, the perspicuity and genuine philosophy he has displayed, certainly entitle him to the esteem and respect of every country;" but Don Quixote was less unsuccessful in getting the transcendent beauty of his Dulcinea acknowledged, by force of arms, than Dr. Barrow will be in his attempts to convince the pupils of the London and Edinburgh schools of the right of France to exult, even "at present, in her claim to pre-eminence, either in pathological or practical knowledge," or "to boast that one of her physicians has done more towards esta-

blishing an accurate knowledge of disease of the lungs, than had been effected in *other* countries (Why other countries only? Why except France itself from the censure?) in two thousand years."

We agree perfectly with Dr. Barrow on the great value of morbid anatomy, and lament with him most sincerely the obstacles which exist in this country to pathological investigation, even in our public hospitals; but we do not agree with him in conceiving that legislative interference would produce much good in regard to this matter. The coroner might indeed be *required* to examine the body in all cases which come under his consideration, a duty which at present is often culpably neglected, and some facilities might be afforded for the keeping of correct bills of mortality and parish registers; but Dr. Barrow's notions of obliging the faculty attached to public hospitals, to keep correct registers of practice, and of regulating the opening of the dead by law, are perfectly chimerical. It is only by removing the prejudices of the people, and by encouraging the zeal of the profession, that any progress is to be made.

In illustrating the advantages to be obtained from dissecting the dead, Dr. Barrow mentions a very curious and important fact, which we regret he has not detailed more circumstantially, although not connected with pulmonary phthisis.

"Some time ago a very alarming disease broke out amongst the children in the workhouse. It was observed to commence in the most sudden manner. The little sufferers were seized with vertigo, without any previous indisposition, and instantly fell to the ground: a very languid state and stupor, from which it was difficult to rouse them, quickly followed. The first that was affected did not excite alarm in the apothecary then in attendance, and he ordered the usual means for clearing the bowels: the child, to his great astonishment, continued in a comatose state, and died in the afternoon of the same day. This circumstance being represented to the church wardens, they interrogated him very closely; and though, in this instance, very little to blame, he was severely censured. In a day or two after, another child was seized in the same manner, of which I had immediate notice; and having already had a melancholy

account of the formidable nature of the disease we had to contend with, I prescribed powerful antimonial emetics, to be repeated every ten minutes till they produced a copious effect. The little patient was then put into a warm bath, and afterwards wrapped in blankets, to effect a profuse perspiration; during which I directed the nurse to awake him every three or four hours, for the purpose of giving a couple of pills of calomel and antimonial powder, to be washed down with a mixture of infusion of senna and salts, and this course to be repeated as long as the coma lasted. This plan having succeeded, the child got well. More of the children, however, continued to be attacked each day, and being treated in the same manner, all, except one, recovered. This child, after showing symptoms of amendment, relapsed two or three times, and died. I took the opportunity of examining the body very minutely, but could find nothing in the brain or stomach to throw any light on this singular disorder. In the heart alone could I discover any morbid change, and here were strong appearances of inflammation, particularly in the aortal valves of the left ventricle. Having obtained this proof of the nature of the disorder, I was enabled to proceed with confidence in place of the timidity and diffidence I felt previous to the dissection, and though more than 200 of the children were attacked, this dangerous disorder was not fatal in any other instance."

We do not think Dr. Barrow warranted to infer, from finding the aortal valves of the left ventricle inflamed in a single instance, that the inflammation of these, or even any part of the heart, occurred in all the two hundred attacked, unless some symptoms, indicating disease of this organ, had been observed in all or most of them.

The translation is, upon the whole, correct. We noticed, however, some errors, as *commissioner*, repeatedly, for *porter*. Its style may be judged of by the extracts we have made.

M. Bayle, in the first part of his work, treats of the essential character of phthisis; of the diseases which have been confounded with phthisis; of the different kinds of phthisis; of the different periods of phthisis; of the state of other parts of the body in those who die of phthisis; of the complication of phthisis with other diseases; and, lastly, of the treatment. These

subjects occupy 130 pages; the remaining 370 contain the histories of particular observations, with dissections and remarks.

M. Bayle, in establishing his essential character of phthisis, disregards entirely those symptoms by which it is commonly recognized during the life of the patient, and deduces it solely from a pathological state of the lungs. In his opinion, "Every organic affection of the lungs which, left to itself, produces their progressive disorganization, succeeded by their ulceration, and finally by death, ought to be considered as phthisis pulmonalis." This definition limits the commonly received idea of phthisis in some respects, and extends it in others. It excludes all diseases, in which there is no actual disorganization of the lungs, however much they may resemble phthisis in their symptoms, and it includes all incurable disorganizations of the lungs, however different in their nature, as soon as they commence, and therefore before they have produced any symptoms to denote their existence.

His particular view of this disease renders it necessary to distinguish it from some other affections, which are united with it, when the subject is differently considered. These are, 1*st*, *Chronic pulmonary catarrh*, when it proves fatal; the catarrhal phthisis of authors. M. Bayle indeed candidly admits, that in its symptoms, especially when accompanied by puriform expectoration and hectic fever, it is very nearly allied to phthisis, but considers it as an essentially different disease, as it only affects the mucous membrane of the lungs, does not disorganize them, and has no tendency to destroy their substance. 2*dly*, *Chronic peripneumony*, which indurates the lungs, gives them somewhat the appearance and consistence of muscle, but does not produce ulceration. One variety of this affection is called *Engouement du poumon*, when the lungs are a little firmer than usual, very heavy, and pouring out from all parts an astonishing quantity of blood, serum, and frothy mucus, without tubercles or ulcerations. 3*dly*, *Chronic pleurisy*, especially when it is not accompanied by any local pain, and when it produces effusion, purulent expectoration, hectic fever, cough, and the highest degree of marasmus. On opening the thorax, the lungs on one side sometimes seem to be altogether

destroyed, or converted into a purulent fluid; but, on accurate examination, they will be found entire, and contracted into a very small bulk. In other cases, the lungs will seem to contain a very large cavity filled with pus, when, in fact, the pus is not in the substance of the lungs, but effused in the space between two of their contiguous lobes adhering by their edges.

M. Bayle next proceeds to describe the various affections of the substance of the lungs, which, in his opinion, constitute phthisis pulmonalis; and of these he has observed six, which sometimes occur without complications, but frequently combined with each other, or with other affections. This view leads him to divide phthisis into six species; 1. tubercular; 2. granular; 3. with melanosis; 4. ulcerous; 5. calculous; and 6. cancerous.

Tubercular phthisis is often simple. The tubercles are formed by a homogeneous substance, always opaque, of a white or dirty white colour; at one time yellowish, at another grayish. Some are very distinctly encysted; the surface being commonly membranous, but in some cases cartilaginous, or even bony. Others adhere to the parenchyme of the lungs, by continuity of substance, and are commonly marked by some black lines. Both kinds are penetrated by capillary blood-vessels, and both often occur in the same person. They vary in size from a millet seed to a chesnut, and are sometimes excessively numerous, and at others there are only two or three in number. They are at first very firm, then grow soft in the centre, which is transformed into a grumous purulent matter; and in the end they are totally destroyed by suppuration. The ulcers arising from the suppuration of tubercles are almost always covered by a distinct membrane which secretes pus, or by an albuminous layer, unless where the substance of the lungs is ulcerated. When there are several ulcerations, they communicate with one another by irregular openings, and form in the lungs rugged cavities, sometimes of great extent. With the bronchi they communicate by round openings. The substance of the lungs is sometimes almost sound around the ulcerations when they are very small, but commonly it is more or less altered. Usually it is not ulcerated, although sometimes it seems to

have almost entirely disappeared, from the compression caused by the tubercles. Sometimes there is a complication of the tubercular with ulcerous phthisis; in which case, ulceration of the substance of the lungs is the consequence of the suppuration of a portion of it, which had become inflamed at the time when the softening of a contiguous unencysted tubercle took place.

Granular phthisis has not been described. The lungs are stuffed with miliary granulations of a cartilaginous nature and consistence, transparent, shining, sometimes speckled with bright black lines or points. They vary in size from a millet seed to a grain of wheat. They are never opaque, and never dissolve, but at last occasion ulcerations of the parenchyme of the lungs; and in this case, there is always an evident albuminous layer lining the ulcer, and even often a distinct membrane, which secretes the pus. It is almost always complicated with tubercular phthisis.

Phthisis with melanosis has been observed, but not understood. It affects only adults, and, above all, persons advanced in years. Those whom it kills have ulcers in the lungs of various sizes, as black as coal, and very hard; sometimes a few lines thick, and sometimes as many inches. The parts remote from the ulceration are commonly very sound; but if the disease affects an entire lung, it is hard, compact, black as ebony or charcoal, and sometimes like half-burnt leather. It is commonly complicated with tubercular or granular phthisis, or even other species, and also occurs without complication.

Ulcerous phthisis is very rare. When absolutely without complication, the ulcer takes place in the very substance of the lung, and is never covered by an albuminous layer, nor by any distinct membrane; or in ulcers which are the consequence of tubercles. It almost always exhales a very fetid and gangrenous smell. Its surface, which is very unequal and irregular, is commonly covered with decayed substance of a brown colour, or with grayish, brownish, or even blackish purulent matter of a pungent offensive smell. These are generally the traces of hæmorrhage. The structure of the part where the ulcer is situated becomes closer, but sometimes without tenacity; at others firm, while the lung at a little distance is quite sound. The

size of the ulcer is very variable, and sometimes there is only one deep seated ulcer. Ulcerous phthisis is commonly quite simple. When it is complicated with other species, there are almost always several excavations communicating with one another. In calculous phthisis, the lungs contain calculi or ossified particles, sometimes in great numbers. They are almost always situated in the bronchial glands, or in small cysts, and sometimes between the bronchi or the first divisions of their ramifications.

Calculous phthisis is sometimes simple, but more frequently complicated with other species, and it occurs sometimes in persons subject to gout or nephritic colic.

In cancerous phthisis the part is of a glossy white, sometimes firm, at others already in a soft state, and always with extremely minute blood-vessels running though it. The cancerous masses are sometimes insulated, at others occupy the parenchyme of the lung. This species is commonly the consequence of a cancerous diathesis. It sometimes occurs single, sometimes complicated with tubercles or melanosis. This is fungus hæmatodes affecting the lungs.

Much as pathological anatomy is to be esteemed, and zealously as it ought to be cultivated, it is from its ultimately enabling us to form, in the first place, a just diagnosis of resembling diseases, and then of establishing a scientific treatment of each, that it derives its practical value. Admitting, then, that M. Bayle is right in his anatomical observations, and we would not willingly object to their excessive minuteness or subdivision, let us next consider the symptoms by which each of his species is to be recognized during life. We may premise that M. Bayle has added to the three stages into which the progress of phthisis is usually divided, an occult stage, where the organic change has taken place, but as yet has not given rise to any of the symptoms which would inevitably have followed, if the patient had not been cut off by another disease.

The first obvious degree of tubercular consumption varies much both in its symptoms and in its duration. It often begins with a dry cough, frequently preceded by some other disease, as spitting of blood, inflammation of the chest, an eruptive fever, or cold. A mucous expectoration then takes place, in

which opaque white threads, or sometimes little lumps like rice much boiled, and sometimes streaks of blood, are to be seen. These succeed slight accessions of fever in the evening, flushing of the cheeks, and burning palms of the hands. It gradually passes into the second degree. Hectic fever commences, the wasting makes progress; constipation and sleeplessness, as well as night sweats, sometimes supervene. The third degree begins in a few months, or not until a year or two afterwards. The hectic fever experiences only slight intermissions; night sweats, diarrhœa, aphthæ, expectoration and cough, exhaust the patient. In this stage, traces of pus are often, but not always, to be found in the expectoration; which, however, in the greater part of phthisical patients, is nothing but an increased secretion from the mucous membrane of the bronchi.

In granular phthisis, hæmoptysis, more or less abundant, or an habitual sense of oppression, is often the first symptom; or it commences with an obstinate dry cough, or a catarrhal affection, accompanied with transparent glairy expectoration. Chronic pulmonary catarrh, hectic fever, and marasmus, precede death, if it be not previously caused by hæmorrhage.

Phthisis with melanosis is slow and long, without any alarming symptoms. Moderate cough; expectoration whitish, rather opaque, round, of much consistency, and floating in water; sometimes vomiting from the cough; little affection of the chest; the sleep disturbed by the cough; slow but very great marasmus, with a pulse a little more quick than natural; sometimes œdema of the legs are the symptoms commonly observed.

Ulcerous phthisis is attended in its first degree with cough and expectoration; at first ropy, afterwards containing strings of blood and streaks of pus. Pains arise in the chest; after which the expectoration becomes manifestly purulent and fetid, and sometimes there is severe hæmoptoë. The hectic fever is constant and well marked, with burning heat.

Calculous phthisis is recognised by the spitting up of concretions of a whitish or grayish colour, after having had a dry cough for a length of time.

Cancerous phthisis is very slow. Difficulty of breathing and slight cough; occasional pains in the breast, more or less un-

supportable, succeeded by expectoration more or less copious, and sometimes very white; and the skin commonly assumes a pale yellowish colour, like that of persons affected with other cancerous complaints.

Such are the symptoms most commonly observed in each species of phthisis, according to M. Bayle, when they exist in their simple form; and it is evident that the diagnosis is even then attended with very great difficulty; but when we consider that two or even three species sometimes exist together, we must anticipate that an accurate and certain diagnosis will be possible in a very few cases only. But the concurrence of several species of degeneration in the same individual naturally suggests a doubt that they do not differ in kind, but only in form; and that M. Bayle has only subdivided the tubercular phthisis of authors into several varieties, in distinguishing it into phthisis with tubercles, granulations, melanosis, and calculi. The ulcerous and cancerous phthisis appear to be sufficiently distinct. But the difficulty of the diagnosis is still farther increased by the numerous diseases with which phthisis is complicated, so that some are suspected of having been the cause of the phthisis, when, in fact, they only accelerated its progress, and others prove fatal chiefly in consequence of the pre-existing disorganization of the lungs. These diseases are exanthematous fevers, peripneumony, pleurisy, pulmonary catarrhs, acute or chronic, hæmoptysis, diseases of the heart, and syphilis. The effect of these complications is well explained by M. Bayle.

"There is still a question of importance to be discussed here:—When phthisis shows itself after pleurisy, hæmoptoë, chronic peripneumony, or even after a prolonged pulmonary catarrh, can we not, or ought we not to presume that the phthisis has been produced by the chronic inflammation of the lungs?

"This question is of the more importance, since many able physicians have regarded pulmonary catarrh as the most frequent cause of phthisis; and have even asserted that rheum, by the consequences it produces, destroys more persons than the plague.

"In order to answer the question we have just stated, it is sufficient to call to mind the following facts:—

"1*st*, I can assert, that of a thousand persons there is not

perhaps one who dies of a chronic pulmonary catarrh uncomplicated. What has occasioned the protracted rheum to be regarded as a dangerous disease is this, that they have confounded with pulmonary catarrh different affections which are accompanied with some symptoms analogous to those of rheum. The affections which have misled them the most frequently, are phthisis at the first stage, consumptions much prolonged, chronic peripneumony, and lastly, acute peripneumony complicated with chronic pulmonary catarrh. When the error in the diagnostic attaches to these two last complications, it is easily rectified, provided the authors who have fallen into this error have given exact descriptions of the diseases they speak of: it is sufficient that we read the dissections they report. In spite of the kind of prepossession that the idea of a simple pulmonary catarrh has given them, they say the lung was hardened, carnified, rendered liver-like; or they employ other analogous expressions, which designate the state of lungs affected with acute or chronic peripneumony, whilst in the simple chronic pulmonary catarrh the lung is not either carnified or hardened: we observe only a slight thickening of the mucous membrane of the air passages, which exude a great quantity of mucous matter. This thickening and this mucous matter are very visible, whether it be in subjects which perish from simple pulmonary catarrh, or in those who, having a chronic pulmonary catarrh, become the victims of some other disease.

"2*d*, Numberless tubercles are observed in subjects who, having been ill only a few days, have died of peripneumony, of pleurisy, of spitting of blood, or of some other acute disease.

"3*d*, The lung is frequently found to be without ulceration or tubercles after chronic peripneumony, after chronic pleurisy, after hæmoptoë frequently repeated, and after chronic pulmonary catarrh of the most obstinate kind. These observations show that if, in some analogous cases, the lung is tuberculous, or filled with miliary granulations, it is because there were two diseases. Besides, in the instances of this complication, the tubercular disease might easily have preceded the inflammation.

"4*th*, Tubercular degeneracy being a very frequent chronic disease, which does not prevent other diseases, and which

even produces some, it is not surprising that tubercles are met with in many persons who have had a chronic inflammation of the chest. For when a hæmoptoë, a pulmonary catarrh, a pleurisy, a peripneumony, or any other inflammatory disease, attacks an individual who has miliary granulations, or a tubercular affection of the lungs, the granulations and tubercles, by continually stimulating this organ, rendered more sensible by a phlegmasy, contribute to keep up the inflammatory disposition. They render the inflammation chronic, which ought to have terminated favourably in a few days; and amongst the inflammations which ought to follow a chronic course, tubercles make incurable or fatal the greater part of those which, by a well-understood treatment, might, without this deadly complication, terminate in a cure. In order the better to perceive this truth, we will examine the influence of tubercles and miliary granulations of the lung in cases of inflammation of the pleura, and we shall see how much more dangerous this inflammation is when it is complicated with a previous degeneracy in the organ of respiration.

"Inflammation of the pleura in a slight degree is very common, since there is scarcely a dead body in which some adhesion of the lung with the contiguous parts does not occur. Besides, these adhesions, as all the world knows, arise from inflammation alone. It is nevertheless rare that the slight degree of phlegmasy, sufficient for the formation of accidental membranes, is sufficiently intense to occasion the symptoms of pleurisy. This slight inflammation of the pleura easily gets well when not kept up by any particular cause. This is not the case if the lung be already affected with granulations or with tubercles, whatever be their nature and quantity. When this coincidence takes place, the inflammation of the pleura and the phthisis have a reciprocal influence, and the patient dies. On opening the body, we find the pleura inflamed, and the lung tuberculous. But we must not conclude from this that the pleurisy produced the tubercles; it only accelerated the progress of those which had a tendency to grow soft and to suppurate. We likewise see chronic pleurisies of long duration without tubercles in the lungs; and meet with numberless tubercles in subjects where the pleurisy, though chronic, has not been of long duration. We may even affirm in general, that simple chronic pleurisy is commonly

of very long duration; and when it is complicated with tubercles, death, as we have already mentioned, is more rapid in proportion as the tubercles are more numerous. Lastly, in chronic pleurisies there are often tubercles in both lungs, though the pleurisy only affects one side of the chest; and frequently tubercles are most numerous on the side where the pleura was not inflamed; at other times there are no tubercles but in the lung of the side opposite to the pleurisy, or even there are tubercles in the mesentery as well as the lung. These facts prove that the developement of tubercles depends on a general diathesis, and not on local irritation.

"*5th*, Tubercular affection is very probably of a scrofulous nature, as M. Portal seems to me to have proved in his treatise on Phthisis Pulmonalis. Some other authors also are of the same opinion. Besides, the scrofulous taint is a particular affection which is not the effect of any inflammatory state, not even chronic; and this degeneracy does not show itself in those who are not scrofulous, even when they are affected with a phlegmasy either acute or chronic.

"These different considerations appear to prove, that inflammatory affections are much more rarely, than is imagined, the decided causes of phthisis. Besides, as I have already said, if these inflammations occasioned this disease, the greater part of them ought to produce the ulcerous phthisis; yet it is precisely the contrary, as I have constantly observed. It is always the tuberculous phthisis that is met with in examples which are adduced in favour of the production of phthisis by acute or chronic inflammation. We have only to consult in the different treatises on phthisis the facts relating to it, in order to be persuaded, even to conviction, that these also, like those which I have observed, ought to be referred to tubercular phthisis."

M. Bayle's opinion that phthisis is almost always incurable and fatal, is calculated to depress all endeavours to discover a method of cure; but our attention must not be relaxed; for he adds, truly, that it is often confounded with other diseases, some of which are easily cured, and that, by proper treatment, the fatal event may sometimes be postponed for many years. The treatment recommended by preceding authors, appears to M. Bayle defective, as they did not distinguish the several

species, which, depending upon distinct causes, require different remedies.

"In fact, we cannot know with accuracy what the indications are in consumption of the lungs, until we have learned to distinguish its species; since, as we shall see by and by, each species is of a different nature, and presents particular indications. Besides, it is impossible to treat a patient properly, unless the indications which the nature of the disease presents be accurately fulfilled. When we mistake the species of phthisis, we mistake also the true indication, for this is subordinate to the nature of the phthisis; therefore we cannot treat the disease properly. If we do decide on a course of treatment, we act at random, and often lessen the chances of cure or of relief the patient might have had if left to the aid of nature. What I advance as to the difference of treatment which suits each species of phthisis cannot be disputed: for can one hope to cure or to relieve, by the same means, cancerous and scrofulous affections? and is it proper to treat in the same manner phthisis from calculi, and that which is the effect of an ulcer?

"One cannot then investigate with too much care what is the species, and what the real nature of the phthisis which we have to treat; since it is essential, in order to enable us to decide upon a suitable treatment; and yet it has been very little developed by authors, for which reason I shall undertake the subject here.

"In each of the six species of consumption which I have described, the affection of the lungs is of a peculiar nature, and belongs to an order of morbid alterations which does not develope itself exclusively in the organ of respiration. To be convinced of this, let us examine each of the diseases to which the different species of phthisis may be referred. These diseases are tubercles, cancer, melanosis, calculi, ulcers, and the developement of accidental cartilages.

"Tubercular affections and cancerous diseases discover themselves, as we know, not only in the lungs, but also in almost all other parts. Calculous concretions also form in different organs; and those which are found in the lungs of consumptive persons appear of the same nature as the calculi, and collections of calcareous matter, which are seen in the articulations of some

gouty persons. The melanosis is a peculiar degeneracy which affects the lungs, the liver, the mesentery, the intestines, and other organs. Ulcers may show themselves in all parts, and most of them are connected with a general disposition. Transparent miliary granulations hold a connection with the spontaneous developement of accidental cartilages; and these cartilages do not occur in the lungs alone, but also in the intestines, in the peritonæum, in the womb, in the heart, and in many other parts."

M. Bayle then proceeds to speak of the treatment of each species of phthisis, of their complications and symptoms, and of the selection and appreciation of the principal means to be employed. For these we must refer our readers to the work itself.

The number of phthisical patients in the Hotel Dieu, has enabled M. Bayle to give some curious tabular views, illustrative of the history of this formidable disease.

"The different kinds of phthisis are by no means all equally frequent. From the facts which I have collected, one might determine their relative frequency by the aid of the following table, extracted from an account taken of 900 dissections:—

Tubercular phthisis	624
Granular phthisis	183
Phthisis with melanosis	72
Ulcerous phthisis	14
Calculous phthisis	4
Cancerous phthisis	3
	900

"In this table I have referred to the same species the particular cases in which this species was simple, and those where it was predominant."

The actual frequency of the disease is dreadful. M. Bayle calculates that one-fifth of the deaths in Paris is caused by phthisis, and that, besides, one-tenth of those who die of other diseases was phthisical.

The following table shows the mortality of phthisis at different ages.

Age.	No. Dead.	Age.	No. Dead.
From 15 to 20 years	10	From 40 to 50 years	21
20 to 30 ——	23	50 to 60 ——	15
30 to 40 ——	28	60 to 70 ——	8——100

It appears that nearly the same number of phthisical patients die in every season of the year.

Number of consumptive persons who died in autumn, 64—winter, 58—spring, 54—summer, 68—Total, 244.

In regard to the duration of phthisis, the following table gives satisfactory information:

Months.	Deaths.	3 Months.	Deaths.	6 Months.	Deaths.	Years.	Deaths.
1.....	1						
2.....	6	1st	16				
3.....	9			1st	60		
4.....	12						
5.....	14	2d	44				
6.....	18					1st	124
7.....	18						
8.....	14	3d	44				
9.....	12						
10.....	8			2d	64		
11.....	7	4th	20				
12.....	5						
				3d	30	2d	48
				4th	20		
						3.....	6
						4.....	5
						5.....	3
						6.....	1
						7.....	3
						8.....	1
						9.....	3
						From the 9th round to the 40th.....	6
						Total.....	200

"Tubercular phthisis seems to be the species which, under all circumstances, is the soonest fatal, by carrying through all the stages those who, in truth, had the seeds of the disease, but never till then felt any symptom of it."

"Phthisis with melanosis appears to be that which commonly lasts the longest; but of those in whom the phthisis lasts a

great many years, some are affected with tubercular phthisis. There are then but few tubercles, and the ulcerations produced by the tubercles seem to form a purely local disease, which does not affect the vital functions."

The ninth and last chapter constitutes two-thirds of the whole bulk of the book. It contains a detail of the principal observations, 54 in number, from which M. Bayle has derived his opinions, and thus he enables others to judge how far they seem to be warranted, besides presenting us with very valuable materials for a history of this disease.

The work is concluded with a recapitulation of some points of doctrine which M. Bayle considers as established in his treatise.

"1*st*, When an accidental disease destroys a person affected with pulmonary phthisis in its commencement, or at its first degree, we always find the lesions of the lung I have mentioned, and no appearance of their tendency to get well. It is not from two or three insulated observations that I discovered this truth: it is from very extensive inquiry, and after numerous dissections of subjects in whom phthisis was at its first periods.

"2*d*, Chronic peripneumony, obstruction of the lungs, chronic pulmonary catarrh, which accompanies diseases of the heart, and other affections of the chest, sometimes resemble phthisis pulmonalis. But when individuals die of any of these disorders, or when any other accidental cause brings on their death, we do not find in the lungs any of the lesions which are remarked in the first degrees of pulmonary phthisis.

"3*d*, When phthisical persons have had partial inflammations of the parenchyme of the lungs surrounding the tubercles, or when they have experienced severe hæmoptysis which has endangered life, if they recover a better state of health, and after having been in marasmus, appear convalescent, they still retain a dry cough or some other symptom, which discloses the existence of phthisis, of which the progress is not interrupted, though the complication which made it more alarming has been cured. Some individuals arrived at this state of apparent convalescence sink under some other accidental disease, and the state of the lungs demonstrates then most evidently that the phthisis was not getting better. Tubercles in the lungs never terminate in resolution, any more than those which arise in other

parts: they remain stationary, or have a tendency to grow soft and to suppurate, as I have always stated, as well before the publication of my remarks on tubercular degeneracies as since that time.

"*4th*, Miliary granulations appear to be of a nature similar to that of cartilages; and when they have displayed themselves in the lungs, they produce there a state of irritation, permanent but impossible to be destroyed.

"*5th*, Cancerous phthisis, in its first degrees, is not less incurable than granular and tubercular phthisis, for scirrhous tumours never terminate by resolution, any more than tubercular affections.

"6*th*, I have shown that we commit great error, when we take for a scirrhus the chronic inflammation of a glandular part; but the error is as great, when we take a chronic inflammation of the chest for a pulmonary phthisis. In both cases we arrive at false conclusions, particularly when the disease terminates in recovery.

"But is it very certain, that the pulmonary phthisis is not a chronic inflammation? We have seen heretofore, that the tubercular degeneracy cannot be considered as a termination of inflammation: we have seen, that, after chronic inflammations which have lasted for a very long time, we did not find in general either tubercles or scirrhi in the lungs. In fine, I have made the remark, that, when tubercles are met with in an individual affected with chronic inflammation of the chest, they are sometimes in the lung of the opposite side to that which is the seat of the inflammation."

"*7th*, It results from what I have stated, that chronic inflammations and catarrhal affections may resemble phthisis, and that they may even contribute to its developement. Hence it follows, that physicians of the greatest talents deceive themselves sometimes in the diagnosis of these different diseases; and in consequence of this mistake, we see some individuals get well, whom one would have believed to be affected with an incurable disorder. These cures have given rise to two opinions diametrically opposite, which divide practitioners; some regarding pulmonary phthisis as curable at the second, or even at the third degree—others being convinced that it is incurable at every period."

ORIGINAL REVIEW.

Commentatio de Tracheitide Infantum, vulgo Croup vocata, cui præmium a quondam Imperatore Napoleone propositum ex dimidia parte delatum est. Auctore Johanne Abrahamo Albers, Medicinæ et Chirurgiæ Doctore, &c. &c. Lipsiæ sumptibus G. I. Goeschen, 1816. 4to. p. 228.

THIS elaborate performance was presented for the premium proposed in the year 1812, by the late Emperor Napoleon, for the best Dissertation written on the disease vulgarly termed Croup. The honours were shared between our author and the celebrated Jurin of Geneva. Great learning and extensive research are displayed throughout the work; references being made to no less than one hundred and forty different publications. In these quotations we observed with pride and satisfaction the frequent and honourable notice of the writers of this country.

Dr. Albers, after enumerating the several appellations given to the disease in question, prefers the title of tracheitis infantum, as more expressive of its real character. It will readily be conceded that the names assigned to diseases have been in many instances arbitrary and unphilosophical. Medicine in common with many other sciences is in a state of continual progression. Much relating to it is wholly conjectural, or but imperfectly known; and we believe that it has not yet arrived at that degree of perfection, which will warrant the expectation of any stability of language. Modern refinement, prematurely attempting to form a purer and more appropriate nomenclature, has unfortunately produced but too much confusion in the language of science; for each individual discovers some new circumstance or feature, omitted by his predecessors. So that after much time spent in acquiring a knowledge of the terms intended to designate any particular object, we find we

have a new vocabulary to learn. How much the purposes of science have been frustrated by such innovations it were needless to explain.

As a proper mark of respect we shall, however, in this analysis, adopt the term tracheitis infantum, as proposed by Dr. Albers.

Our author considers the disease as consisting in an inflammation of the mucous membrane, lining the larynx and aspera arteria, and bronchial tubes; generally accompanied by a copious secretion of the coagulable lymph, or fibrous part of the blood. This is the prevailing doctrine of the day, and is amply confirmed by the anatomical observations of Baillie, Cheyne, and others of the highest authority.

He describes the disease as varying in the mode of its attack, sometimes affecting the patient suddenly, at other times coming on in a more gradual and insidious manner. In many cases it puts on the symptoms of catarrh, and is often not distinguished from that disease for some days. In other cases it comes on with an immediate sense of suffocation. The voice becomes hoarse, the cough is of a peculiar sound, resembling the hoarse barking of a dog, or it is shrill, like the crowing of a cock. The hoarseness, the barking or stridulous cough, and the great difficulty in breathing, singly, or collectively, he considers as constituting the disease. He remarks, that he has known the hoarseness to continue for weeks. These symptoms, in his opinion, are dependent partly on the thickening of the membrane lining the larynx, and partly on the exudation of coagulable lymph, whereby the passage is constricted.

According to the experience of our author, those who have been once affected with the disease, are not exempt from future attacks, but on the contrary, they are often more disposed to repeated invasions. The disease is usually less formidable as the child approaches towards puberty. Hence the subsequent attacks are generally not so severe, though the reverse is sometimes the case.

The fever that accompanies the disease, is more commonly synocha, though in some instances, the typhoid character prevails.

The symptoms which come on, or are particularly aggravated about midnight, undergo some remission, or even total cessation in the morning, and early part of the day.

The disease, Dr. Albers considers as fraught with danger, though not necessarily mortal; an opinion, which appears to have been entertained by Chalmers. He acknowledges the difficulty of forming a correct prognosis, and remarks that some died suddenly, whom he did not apprehend to be in danger; and on the other hand, that some recovered whom he believed to be past all hopes.

He pronounces tracheitis to be most dangerous in children of a lax habit and prone to diseases of the mucous membranes. Hence our apprehensions are greater when the coagulable lymph is found in any great quantity. Nevertheless, many fat and robust children are violently affected from the beginning, and are in imminent danger from the mere derangement in the nervous system. Yet such cases are readily cured, when timely assistance is given, to the great credit of the art.

In answer to the question, whether any of the ancient writers or the authors, prior to the last century, have described the symptoms, which may be considered as pathognomonic of croup, he cites from the writings of Hippocrates, a passage which affords very satisfactory evidence, that the disease existed from the earliest ages, though it appears not to have been considered as a specific disease, but rather as a variety of angina. The popular name of croup, shows that it was familiarly known in North Britain, before it had engaged the attention of medical men, so far as to become the subject of particular description.

As the disease is acknowledged to be brought on by cold and moisture, our author does not hesitate in considering it as more prevalent in northern climates; and in corroboration of this opinion, he adduces the observations of physicians residing in different parts of Europe.

He states that croup is a disease, especially incident to children. He quotes cases of its having affected infants at the breast, and even at the early age of one month. In proof that those of riper years are not wholly exempt from its attacks, he adduces a long list of authorities, and refers to the memorable case of our ever to be lamented Washington.

The cause why children are more frequently affected with tracheitis he considers as twofold. In the first place they are more predisposed to inflammation of the mucous membranes; moreover tracheitis when connected with the exanthemata, is observed to be peculiar to persons of a tender age. But the cause on which he lays the greatest stress, is the state of the rima glottidis; for this aperture is observed to be more than proportionably small in persons under the age of puberty. The greater prevalence of tracheitis among boys, he refers partly to the form of the trachea and larynx, remarkable even at this period, and partly to the greater predisposition to inflammatory affections, and to a more frequent exposure to the causes exciting the disease.

Among the occasional causes he ranks the sudden vicissitudes from heat to cold, especially when combined with moisture. This is confirmed by the observations of the most intelligent writers. He mentions, however, that he has seen this disease during the month of August 1807. And in the month of May, of the ensuing year, when an unusually fervid season succeeded to an intense degree of cold, he was called to three cases. In the same month, the like number were visited by his friend Olbers, an eminent physician of Bremen, and well known to the public by his anatomical researches. He remarks that tracheitis is more prevalent between the autumnal and vernal equinoxes; and that in this period, the months of November and December, noted for the long continued fogs, are pre-eminent for the frequent occurrence of the disease. Persons inhabiting the borders of rivers, and the neighbourhood of marshes, situations naturally abounding in moisture, are particularly liable to be affected with croup.

Under the head of occasional causes, he notices the defect of covering, whereby the body is not sufficiently defended against the vicissitudes of the weather. He suspects that the disease is often produced in Scotland, by the children going bare-footed, and with their necks exposed, during the depth of winter. He also thinks that the close cutting of the hair, renders children more liable to the disease. In support of this opinion, he adduces the authority of Sœmmering, and quotes the writings of Wolf of Altona, who remarked that the Jews inhabiting that city were less afflicted with croup, and who

ascribed this exemption, to the custom among that nation of keeping the head covered.

He pronounces tracheitis not to be contagious. When the disease affects several members of a family, he considers it as owing to a peculiar idiosyncrasy in such persons, or to their being exposed to the same exciting causes.

To the question whether tracheitis is ever consequent on other diseases, and especially the exanthemata; he answers in the affirmative. This assertion is founded on his own experience, and is largely confirmed by the observations of Morton, Starr, Johnston, Withering, Clark, Ueberlacher, Heberden and Rush.

Dr. Albers performed a number of experiments, with the view of ascertaining whether the disease could be excited artificially in the lower order of animals. After making an opening into the trachea, below the cricoid cartilage, he injected into that tube various stimulating fluids, as a solution of the oxy-muriate of mercury. By these means violent inflammation, and the exudation of coagulable lymph were produced, but still many of the symptoms of tracheitis were wanting.

We now proceed to notice the practice adopted by our author in the treatment of the disease. When tracheitis is of the sthenic character or accompanied by the synocha form of fever, his principal reliance is placed in emetics. But he appears not to have employed such large doses as are frequently directed. The tartrite of antimony and the ipecacuanha root were the articles which he generally prescribed, sometimes separately, but often in conjunction. He extols, moreover, the efficacy of emetics in relieving spasm, on which the disease occasionally depends. If the disease should be very violent, the fever and determination to the head very great, he recommends the immediate abstraction of blood. It was however a matter of surprize, on perusing the book, to learn that our author depended solely on topical bleeding, by means of leeches, and that he never directed blood to be drawn from a vein. The leeches he directs to be applied to the front of the neck, in the neighbourhood of the larynx. When these remedies fail to remove the disease, he orders the application of a blistering plaster so as to cover the larynx and trachea, down to the sternum.

Of the powers of mercury, in curing the disease, Dr. Albers is not so warm an advocate as many who have written on the cure of croup. To prevent the vomiting, so frequently excited by the preparations of this mineral, he was in the habit of combining small doses of magnesia. He considers the combination of camphor and mercury, as particularly adapted to allay inflammation. The camphor he states, as possessing the further advantage of restraining the diarrhœa, which so often follows the use of mercury, and in producing a determination to the skin. It is with this latter view, of determining to the surface, that he so highly extols the combination of camphor and the red sulphur of antimony. His mode of prescribing these is as follows:

Take of the Syrup of marshmallows one ounce,
Mucilage of gum arabic half an ounce,
Camphor four grains,
Red sulphur of antimony three grains, and form a linctus, of which give the patient two teaspoonfuls every two hours. This is suited for a child of three years.

If it is deemed adviseable to administer mercury, while the patient is taking the above remedy, he prefers giving it at the intermediate hours.

In the use of the polygala senega, so warmly recommended by Archer, he prefers the infusion to the decoction, as retaining the volatile parts in greater perfection. Where the disease has brought on great debility, accompanied by spasmodic respiration, our author expresses himself in high commendation of musk.

In the asthenic form of tracheitis, especially if the children are of a scrofulous habit or worn down by previous disease, emetics are peculiarly adapted to afford relief, and often induce an immediate solution of the disease. After the operation of the emetic, he recommends a combination of camphor and the red sulphur of antimony with alternate doses of mercury, guarding against too frequent evacuations from the bowels. Here the polygala senega, he considers as possessing peculiar efficacy; and blisters, he states, ought not to be omitted. If the disease should increase, we must resort to musk and those articles which stimulate the surface.

In cases of tracheitis, coming on after malignant small pox, he recommends that the disease should be combated by the exhibition of mercury. But as in this form of small pox, the bowels are so liable to be affected with diarrhœa, it becomes necessary to conjoin opium. Our author however, appears to be opposed to the exciting of salivation.

In the measles, which are often ushered in by tracheitis, an emetic is to be prescribed in the first instance. If the inflammatory action should be great, he directs bleeding by means of leeches and the application of a blister to the throat. Internally, he advises the exhibition of the acetite of ammonia, with elder-flower water and simple oxymel. When the sthenic diathesis is subdued, he employs camphor and the red sulphur of antimony. If tracheitis comes on after the eruption of measles, we must first ascertain whether there exists any inflammation of the lungs, for this would forbid the use of emetics. If the fever is typhus, we must resort to camphor, musk, and the red sulphur of antimony. When tracheitis comes on after the measles have been cured, it is to be treated according to its peculiar character.

When tracheitis is combined with scarlatina, if the phlogistic diathesis prevail, the disease is to be treated accordingly; but should it appear in conjunction with the malignant or typhous form, the only remedies are mercury, musk, camphor and blisters.

We shall now close this analysis in which we have endeavoured to give, in a condensed form, whatever we could discover in the work which was likely to advance a knowledge of the disease. We have offered a succinct, yet tolerably complete view of the practice adopted by our author. The impression left on our mind by a careful examination of the means proposed by him for combating the disease, is, that his practice was feeble, and not adapted to the violent forms of croup, such as we frequently meet with in this hemisphere. Perhaps we should pass a correct judgment on the work, if we stated that though highly ingenious and instructive, it appears to be rather the result of great reading and literary research, than of actual observation, drawn from the bedside of the sick.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

VACCINATION.

THE ordinance of the city councils, for promoting Vaccination in the city, has been carried into effect, by the appointment of Physicians, the report of whose operations has not yet been published.

By the report made at the annual meeting of the Vaccine Society, on the first day of January 1817, it appeared, that their Physicians had successfully vaccinated nineteen hundred persons, in the City, Northern Liberties and the district of Southwark, during the last year; making the whole number successfully vaccinated by the Physicians of the society, since its formation in 1809, ten thousand six hundred and thirty-three.

DISPENSARIES.

Statements of the proceedings of the three Dispensaries have been published, by which it appears, that,

They have had under their care the following number of patients.

Philadelphia Dispensary.

From December 1, 1815, to December 1, 1816.		3022
Cured, - - -	2662	
Dead, - - - -	87	
Relieved, - - -	98	
Irregular, - - -	14	
Removed, - - -	24	
Remaining under care, -	137	3022

Northern Dispensary.

From October 1st, to December 30th, 1816.		303
Cured, - - -	141	
Dead, - - - -	16	
Relieved, - - -	3	
Removed, - - -	2	
Irregular, - - -	11	
Remaining under care, -	130	303

Southern Dispensary.

From August 26th, to December 31st, 1816,		520
Cured, - - - - -	409	
Dead, - - - - -	15	
Relieved, - - - - -	36	
Removed, - - - -	3	
Irregular, - - - -	4	
Remaining under care, -	53—520	

The Trustees of the University of Pennsylvania, on the elected the following Professors.

Dr. Robert M. Patterson, Professor of Natural Philosophy.

Dr. William P. C. Barton, Professor of Botany.

Dr. Charles Caldwell, Professor of Natural History, including Geology and Zoology.

Dr. Thomas Cooper, Professor of Mineralogy and Chemistry, as applied to Agriculture and the Arts.

Dr. Thomas T. Hewson, Professor of Comparative Anatomy.

American Philosophical Society.

At an Election of Officers of the American Philosophical Society, held at their Hall in Philadelphia, after due notice given, on the 3d day of January 1817, the following officers were chosen:

President—Caspar Wistar.

Vice-Presidents—R. Patterson, William Tilghman, P. S. Du Ponceau.

Secretaries—T. C. James, R. M. Patterson, J. S. Dorsey, W. P. C. Barton.

Counsellors for three years—Thomas Cooper, James Gibson, N. Chapman, S. Colhoun.

For one year—William Hembel, Jr.

Curators—Z. Collins, J. Cloud, T. T. Hewson.

Treasurer—John Vaughan.

METEOROLOGICAL OBSERVATIONS.

STATE of the weather at Philadelphia during the last six months of 1816.

JULY.

Thermometer—Lowest, at 9 A. M. 66. 1st day of the month.
Highest, at 3 P. M. 78. 25th and 27th.
Mean, ... 70.

Little rain this month.

AUGUST.

Thermometer—Lowest, at 9 A. M. 64. 28th and 29th of the month.
Highest, at 3 P. M. 87. 17th.
Mean, ... 70.

A cool summer, such as is seldom experienced—very little thunder and lightning. The crops of wheat and rye, very fine as to quality, but in many places small as to quantity—oats abundant—vegetables excellent; and fruit very good and plentiful—grass crops short. Earthquakes in Great Britain and some of the Eastern States.

SEPTEMBER.

Thermometer—Lowest, at 9 A. M. 56. 28th day of the month.
Highest, at 3 P. M. 83. 3d.
Mean, ... 62.

Weather cool—Indian corn and buckwheat suffered much by cold weather—all the grain crops abundant in Ohio, Kentucky and Tennessee. The summer and autumn very healthy.

OCTOBER.

Thermometer—Lowest, at 9 A. M. 52. 19th and 28th days of the month.
Highest, at 3 P. M. 67. 3d, 21st and 22d.
Mean, ... 54.

Northerly and westerly winds, have been more prevalent than usual this season—the latter part of the season, south westerly winds were common.

NOVEMBER.

Thermometer—Lowest, at 9 A. M. 34. 26th day of the month.
Highest, at 3 P. M. 74. 4th.
Mean, ... 50.

Weather mild for the season.

DECEMBER.

Thermometer—Lowest, at 9 A. M. 27. 3d day of the month.
Highest, at 3 P. M. 64. 27th.
Mean, ... 35.

This month unusually mild—no fall of snow here. An healthy season. Small-pox continues amongst us, but has not spread much. The measles have not entirely disappeared. The disease, generally called *yellow fever* has been very prevalent and mortal in several of the West India Islands, particularly Guadaloupe and Martinique. From every part of the United States we hear of an unusual degree of health. In Europe the weather has been inclement—great rains—and failure of crops.

Lobstein's recent Remarks and Observations upon the Healing Power of Phosphorus. Communicated by Dr. VON EMBDEN, at Hamburgh.

[From the London Medical and Physical Journal, for Oct. 1816.]

Professor LOBSTEIN, at Strasburgh, in his monography on phosphorus, in addition to the copious historical notices respecting its invention, its physical and chemical nature, and the use hitherto made of it in cases of sickness, has also published the results of his own experience; of the latter, we shall offer a very short account. Phosphorus is like other bold remedies: an improper use, or a disproportionate dose, produces dangerous consequences; it is, therefore, of great importance for the practical physician before he makes use of it, to be exactly informed of the manner of its application, and the dose to be administered.

Mr. L. objects to all the present pharmaceutical forms of phosphorus, except its solution in sulphuric æther. Only in this

form, its caustic property is changed into a reviving and analeptic substance. According to Lœbenstein Lœbel's proposal, he adds a small quantity of a distilled aromatic oil, whereby not only the efficacy of the remedy is improved, but it is also more easily preserved; the solution of phosphorus is thus complete. To prevent its decomposition, it is proper to give it in a little syrup, or on a lump of sugar.

With regard to the dose, he has been taught by experience that in most cases one grain of phosphorus in twenty-four hours is quite sufficient, and that we ought neither to be too timid nor too bold in its administration; however, it will be always useful to begin with a small dose, and to increase or lessen the same, according to the symptoms. As soon as the patient feels any inconvenience, perceives any heat in the stomach, or vomits, it must be set aside.

Respecting the rules of precaution necessary in its application, M. Lœbenstein Lœbel's remarks are fully confirmed. The phosphorus agrees better, and can be borne in a larger dose, when the air is dry and clear than in cold and rainy weather. It ought never to be taken on an empty stomach, but always an hour after the patient has taken some nourishment; salad and acid food, and drink in general, even beer, is improper. To quench the thirst, a mucous solution of salep, with sweet and generous wine, is the best beverage; the patient must also refrain from drinking immediately after having taken the phosphorus.

In acute diseases, when there is commonly but little appetite, broth with a little nutmeg, or vermicelli, sago, &c. may be taken; but, in chronic disorders, where digestion is not impaired, veal, beef, and mutton, either boiled or roasted, fowls, snipes, hares, as also light vegetables, such as carrots, French beans, &c. are a fit diet. Cabbage, turnips, onions, radishes, rape, cole, pease, &c. must be avoided, causing a sensation of fulness in the region of the stomach, together with anxiety, insupportable heat, and often vomiting and diarrhœa. The food must neither be taken too hot nor too cold, fruit and milk are prohibited.

In case the patient can go out, it is of the greatest importance to be on his guard against catching cold, which is apt to

occasion vertigo, and diarrhœa, or a relapse. Convalescents should wear a flannel shirt next to the skin; warm baths agree also very well with persons taking phosphorus, particularly in disorders of the nervous system, but they must stay above a quarter of an hour in it.

Effects of the Phosphorus upon the Animal Organism.—In acute diseases, such as typhus, the effects of phosphorus appear frequently after four hours, but sometimes not till twenty-four. The vital warmth returns, transpiration is restored, the pulse improves, the urine is voided freely and commonly turbid, with a sediment; the abdomen loses its tension, the excrements have a sulphureous smell and shine in the dark; the delirium ceases, and the patient recovers his recollection, the mental faculties return, and a beneficial sleep restores the strength in a few days, the tongue grows clean and the appetite improves, and the countenance becomes chearful. These appearances, however, do not take place so soon in persons advanced in years, they vary according to the nature of the disorder, and do not show themselves so distinctly in chronic cases.

Phosphorus is a remedy the effect of which extends over all the systems of the animal economy, by rousing their activity, but it particularly operates upon the nervous system; the effect is very speedy and powerful, but of short duration. It is one of the most penetrating volatile excitants, and very particularly adapted for reviving the vital activity when nearly exhausted.

But this beneficial effect is only produced when the remedy is completely dissolved in its vehicle; when given in substance it operates as a violent caustic, equal to actual poison, by exciting most violent pains, burning, convulsion, tremor, annihilation of the powers, and death. At other times, if its use is too long continued, it causes the most obstinate complaints in the stomach; and, in case of a scirrhosity of the stomach, occasions death, as has been discovered afterwards on dissection.

Mr. L.'s own observations, communicated upon the efficacy of phosphorus in various disorders, are all of that kind where the complaint has resisted other powerful remedies, or had been of long standing.

In three cases, where typhous persons were in the last stage

of exhaustion, and where other irritative remedies seemed quite ineffectual, the vital activity was again roused in an astonishing manner by a few doses. The saving of a peripneumonic patient in the last stage of debility, performed by it, was equally unexpected. A tertian fever, obstinately resisting a variety of remedies, such as bark with flor. sal. ammon. mart., opium with cinnamon, and even arsenic, was considerably lessened in the next attacks, and disappeared after phosphorus had been administered for eight days, during the intervals. A periodical cephalalgia in a very irritable woman, an obstinate cardialgia, and a chronic gouty complaint, wandering about in the body, was cured by it; menstruation, suppressed by catching cold, was restored, and the chlorotic patient recovered by the use of this remedy, combined with the tincture of cinnamon. It is superfluous to mention, that phosphorus, in the hands of a prudent physician, is a very powerful remedy, where the object is vigorously to rouse the vital activity, and to operate in a decisive manner; and Mr. L., by communicating these observations, in confirmation of the healing powers of this important remedy, has acquired a decisive merit.

New Pharmacopœia of France.

We rejoice to learn that the Faculty of Paris are at length sensible of the reproach which they have so long merited, for the want of a National Pharmacopœia:—a defect, which we took occasion in the fourth volume of the *Repository*, p. 382, to descant upon with some degree of severity.

Lond. Med. Rep.

Experiments made with a view to ascertain the Principle on which the Action of the Heart depends, and the Relation which subsists between that Organ and the Nervous System. By A. P. Wilson Philip, Physician in Worcester.

[From the Eclectic Review, for October, 1816. Vid. Philosophical Transactions for 1815.]

This paper contains an account of twenty-three experiments, and as the conclusions to which they lead are chiefly important, we shall transcribe the inferences which Dr. W. P. has himself deduced from them.

1. That the muscles of involuntary motion obey the same laws with those of voluntary motion.

2. That the apparent difference in the nature of these muscles, arises from their being under the influence of different stimuli.

3. That they are both capable of being stimulated through the nervous system.

4. That the power of both is independent of the nervous system.

5. That what is called the nervous system, consists of two parts, whose existence is not immediately dependent on each other; the one performing the sensorial functions, the other conveying impressions to and from the sensorium, and, without bestowing any power on the muscular system, acting as a stimulus to it.

6. That there is therefore in the most perfect animals, a combination of three distinct vital powers, not immediately depending on each other; one of the muscular system, one of the nervous system properly so called, and one of the sensorial system.

7. That the muscular system, though independent of the nervous system, is so influenced by it, that the power of the former may even be destroyed through the nervous system.

8. That both the muscular and nervous systems, though independent of the sensorial system, are so influenced by it, that they may even be destroyed through it.

9. That although in the less perfect animals, we find the muscular life existing alone, and the muscular and nervous existing without the sensorial life; in the more perfect animals they are so connected, that none can exist long without the others.

10. That nutrition, circulation, and respiration, are the means by which they are so connected.

Some Experiments and Observations on the Colours used in Painting, by the Ancients. By Sir HUMPHREY DAVY, LL.D. F.R.S.

THE different colours examined by this eminent chemist, have been found in making excavations in the Roman territory; or in the ruins of ancient magnificence with which it abounds. He obtained permission also to examine the colours of a celebrated antique painting, the Nozze Aldobrandine. Of three reds found in the baths of Titus, one was minium or red oxide of lead, the other two ochres of different tints; another red found on the walls of the bath proved on examination to be vermilion. The reds of the Aldobrandine painting proved to be all ochres. The yellows, of which three different varieties were submitted to examination, were mixtures of yellow ochres with different proportions of chalk, and one was a mixture of yellow ochre with red oxide of lead. The yellows in the painting were all ochres. The blues were of different shades from the mixture of different proportions of chalk, but they all owed their colour to the same substance, a fine blue powder, similar to the best smalt or ultra-marine, rough to the touch, which did not lose its colour by being heated to redness, but was semifused and agglutinated at a white heat. On applying the usual means of analysis, it was found to be a blue frit containing soda, and coloured by oxide of copper. It appears, too, that they were acquainted with a species of indigo. Different antique specimens of fine transparent blue glass, Sir H. ascertained to be coloured with oxide of cobalt. Other specimens of pastes and glass were coloured by oxide of copper, but the colour of these had a tint of green, and their transparency was much less perfect. The different greens examined proved to be mixtures and combinations of oxide of copper. The green glasses of the ancients were found also to be coloured by the oxide of copper. The purple, was found to be a lake mixed with carbonate of lime; but whether of animal or vegetable origin it was found impossible to determine. The blacks had all the characters of pure carbonaceous matter; and of the browns, several proved to be ochres, and one contained oxide of manganese, as well as oxide of iron. The whites presented

the characters of carbonate of lime, and fine aluminous clay. Sir H. endeavoured to ascertain by what means the colouring matter had been fixed on several pieces of stucco, and on the Aldobrandine painting; but he could not detect the presence of any wax varnish, or any animal or vegetable gluten. Of these different colours, the azure, the red and yellow ochres, and the blacks, have preserved their colours perfectly in the ancient fresco paintings, not having undergone the smallest apparent change, but the others have all suffered more or less.

Eclectic Review.

Experiments to ascertain the Influence of the Spinal Marrow on the Action of the Heart in Fishes. By Mr. William Clift.

In this communication, Mr. Clift has given a very minute detail of the phenomena which he observed in four experiments made upon the carp, a fish which appears to be more tenacious of life than most others. The object which he had principally in view was to determine the influence of the spinal marrow upon the muscular system. The results which he obtained we shall transcribe.

1. The muscles of the body of a carp, four hours after the brain and heart are removed, can be thrown into powerful action.

2. The moment the spinal marrow is destroyed, these muscles lose all power of action.

3. When water is admitted into the pericardium, and the fish allowed to swim about, the action of the heart ceases sooner than when that organ is exposed to the air, and the fish kept quiet.

4. Whether the heart is exposed or not, its action continues long after the spinal marrow and brain are destroyed, and still longer when the brain is removed without injury to its substance.

5. The action of the heart is accelerated for a few beats, by exposure of that organ; by exposure of the brain; injury to the brain; destruction of the spinal marrow while connected with the brain; by the connexion between the brain and spinal

marrow being cut off: while removing the whole brain produces no sensible effect upon the heart's action, and destroying the spinal marrow after it is separated from the brain, renders the action of the heart slower for a few beats.

Eclectic Review.

On the Nature and Combinations of a newly discovered vegetable Acid; with Observations on the Malic Acid, and Suggestions on the State in which Acids may have previously existed in Vegetation. By M. Donovan, Esq.

This acid, to which Mr. Donovan has given the name of Sorbic acid, is obtained in rather large proportions from the ripe fruit of the Sorbus Aucuparia, though it is not confined exclusively to that fruit. When perfectly pure, it is transparent, fluid, and inodorous, soluble in alcohol, and in any proportion in water. When evaporated, it becomes an uncrystallizable solid mass, but deliquescent. If subjected to distillation, no part of the acid passes over in the process. Its acidity is such as to cause a painful sensation upon the tongue. It is little changed by being kept in an uncombined state. In those fruits in which it exists mixed with malic acid, it is the first to disappear, while the malic acid retains its distinctive properties long after the commencement of decay in the plant. The saline combinations which this acid forms, sufficiently distinguish it from the other vegetable acids, and especially from the malic with which it is generally found co-existent. With lead it forms three saline combinations, a super, a neutral, and a subsalt. The super-sorbate does not assume the solid form, but the neutral and subsorbate require more than 5000 times their weight of water for their solution. With potash, soda, and ammonia, when the acid is in excess, it forms permanent crystals, which are soluble in water, but insoluble in alcohol. The malic acid forms with these bases, salts which are deliquescent and uncrystallizable. With the earthy carbonates, the sorbic acid forms neutral salts which are precipitated as soon as they are formed. With alumina it does not appear to have any action, and hence Mr. D. thinks it may probably prove a valuable agent in the hands of the analytic chemist, to obtain this

earth perfectly pure. Mr. D. observes that this acid is never found in any mature fruits, which contain any other acid than the malic; that the malic acid is never found alone in any mature fruit, but always accompanied with the sorbic, and that these two acids when co-existent exclude every other. The fruits which contain these acids together, are apples, plums, the berries of the sorbus, barberries, and sloes; of these the sorbus berry contains the largest quantity of sorbic acid, unripe apples less, ripe apples and sloes still less, barberries very little, and plums least of all. As the discovery of the general co-existence of this acid with the malic renders Scheele's process for procuring malic acid liable to considerable objection, M. D. recommends the general adoption of Vauquelin's process for obtaining it from the juice of the Sempervivum Tectorum, in which this acid exists alone, in a state of combination with lime; but as there is some difficulty in completely decomposing the malate of lead by sulphuric acid, he suggests the employment of sulphuretted hydrogen, to remove the last portions of lead, by which means the malic acid is obtained perfectly pure. M. D. thinks it probable that the vegetable acids are not formed primarily by the immediate combination of their elements, but by the combination of oxygen with the bitter principle, and the facts which he has adduced give considerable probability to this view of their origin.

Eclectic Review.

A Quarterly List of Foreign Publications, from July, 1816, to the end of September, 1816.

[From the Journal of Science and the Arts, No. III.]

NATURAL HISTORY.

Histoire naturelle des Animaux sans vertèbres, par Mons. Le Claval Delamarck. 3 vol. 8vo. Paris.

A. Risso, Histoire naturelle des Crustacés des Environs de Nice, 1 vol. 8vo. plates.

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